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THE

NATURALIST

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A

MONTHLY JOURNAL OF

NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY

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Curator of the Municipal Museums, Hull.

Hon. Member of the Yorkshire Naturalists' Union; the Spalding Gentlemen's Society; the Doncaster Scientific Society; the Selby Scientific Society.

AND

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WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

J. GILBERT BAKER, F.R.S., F.L.S. GEORGE T. PORRITT, F.L.S., F.E.S.

Prof. PERCY F. KENDALL, M.Sc., F.G.S. JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.

1918.

LONDON:

A. Brown & Sons, Ltd., 5, Farringdon Avenue, E.C.

And at Hull and York.

1PJP4.2

PRINTED AT BROWNS' SAVILE PRESS,
SAVILE STREET AND GEORGE STREET, HULL.

JAN. 1918. No. 732
(No. 507 of current series)

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THE MUSEUMS, HULL:
AND
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LONDON:
A. BROWN & SONS, LIMITED, 5, FARRINGDON AVENUE, E.C. 4
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JUN 21 1920

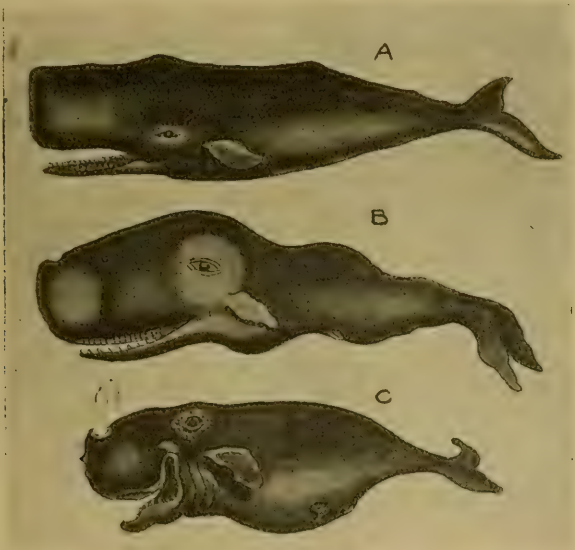
THE NATURALIST

FOR 1918.

NOTES AND COMMENTS.

SPERM WHALES.

In *The Animal World* for December, Mr. Donald Payler has an article entitled ' Facts and Fables about Whales.' In this he gives the accompanying illustration, which we are kindly permitted to reproduce. He states that 'sperm whales'



Three conceptions of the Sperm Whale:—(A) as it appears; (B) from Pennant's 'British Zoology,' 1776; (C) from Dewhurst's 'Nat. History of Cetacea,' 1834.

appear to feed almost exclusively upon cuttlefish, though they are known also to eat medium-sized fishes, such as the bonito, albicore and rock-cod. We do not, of course, know how large the prey consumed in exceptional cases may be, but it is said that the throat is capacious enough to accommodate the body of a man.

MARTIN SIMPSON.

We learn from *The Yorkshire Observer* that at the recent annual meeting of the Yorkshire Geological Society, held at Leeds, a paper was read by Mr. T. Sheppard upon the life and

work of the almost forgotten geologist, Martin Simpson. Martin Simpson was born in 1800 and died in 1892, having long outlived his fame. He spent most of his life in the Whitby district, and for over half a century had charge of the valuable geological collections in the Whitby Museum, though for a short period he was the curator of the Yorkshire Geological Society's collections, now deposited in the Leeds Museum. He was one of the pioneer workers among the Liassic rocks of Yorkshire, and considering the early date of his researches, the enormous amount of information he accumulated was remarkable, and his methods of research had a surprisingly modern air. He was the author of a number of geological memoirs, most of which were now exceedingly scarce. Mr. Sheppard showed a complete series of these works which he had collected, the most important scientifically being a memoir on the ' Ammonites of the Yorkshire Lias,' which was published in 1843, and was long since said to be so rare as to be known only by a single copy. Another work, published when the author was in his eight-fourth year, was ' The Fossils of the Yorkshire Lias,' in which no fewer than 743 species were enumerated and described. Simpson measured with a foot rule the thickness of the beds in the cliffs north and south of Whitby, taking special note of the specimens peculiar to each bed—a very early example of zonal collecting.

YORKSHIRE SCIENTIFIC SOCIETIES.

In ' Yorkshire's Contribution to Science,' the present writer had the privilege of giving particulars of the publications of the different Scientific Societies in Yorkshire. For many years he has been preparing a history of the various scientific Societies, large and small, in the county, many of which, though they have not published any definite Transactions or Journal, have nevertheless accomplished good work, and from their ranks have sprung workers whose names are now known far beyond the county. While it is hoped that the history may include particulars of every Natural History, Scientific, Botanical, Geological, Entomological, Archæological, Numismatic or other Society in the county, it is quite possible that some may have existed, particulars of which have escaped his notice. Certainly in many cases casual newspaper reports or references in old Natural History Journals are all that has been obtained. If, therefore, any reader of *The Naturalist* has any programmes, syllabuses, reports or any information whatever, relating to these societies, perhaps he will kindly write to the Curator, Municipal Museum, Hull. Any matter forwarded will be returned, if desired.

THE SHAP MINOR INTRUSIONS.

At a recent meeting of the Geological Society of London, a paper with the above title, by James Morrison, was read.

It deals with the minor igneous intrusions occurring in the triangular area between Shap, Windermere, and Sedbergh. From their field relations and petrographic characters the intrusions are found to belong to one or the other of two well-marked groups, a division which is regarded as connoting also an age-classification. The rocks of the earlier set, characterized by the presence of large orthoclase-felspars of the granitic type, are intimately associated with the granite, to the immediate neighbourhood of which they are practically confined. The rocks range from quartz-felsites to lamprophyres. Of considerable interest in this group is a series of hybrid intrusions, consisting essentially of rocks of a more or less basic magma enclosing xenocrysts of a more acid (but allied) magma obtained by settlement under intratelluric conditions. The constitution of any given member of the series is determined by two factors: the abundance of xenocrysts and the composition of the matrix, an increasing basicity in the latter (due to original magmatic differentiation) and a decrease in the former marking the successive stages. The more acid have affinities with the porphyrites, the more basic with the lamprophyres, the series ranging from modified biotite porphyrites to modified pilitic lamprophyres. The later intrusions are typically free from the large orthoclase-felspars, though quartz-grains may occur even in the basic members. Associated centrally with the earlier set they are distributed over a much wider area, overlapping the former in every direction. They are the result of a further differentiation, and are assigned to a later period when igneous activity was renewed on a more or less regional scale. The rocks include acid felsites and spessartites. The rocks of the earlier set agree in general direction with the north-north-west fractures transverse to the strike of the country-rock, while the later intrusions trend generally east of north.

SIR ARCHIBALD GEIKIE.

The honour of associate-membership of the French Academy of Sciences, which has just been conferred upon Sir Archibald Geikie, is not the first distinction the famous geologist has won from France. Already he was an officer of the Legion of Honour and a correspondent of the Institute of France. Sir Archibald is eighty-two.

BLACK PUPÆ OF ABRAXAS GROSSULARIATA.

In a recent number of *The Entomologist's Monthly Magazine*, Mr. G. T. Porritt has the following interesting note:—'In *The Entomologist's Monthly Magazine*, 1916, page 206, I recorded the occurrence from my wild larvæ of *Abraxas grossulariata* of a few pupæ of an uniformly glossy black colour, without any trace of the usual golden wings. This

year considerably more of these black pupæ occurred, but not from the wild larvæ, of which from some 2,000 I did not notice a single one. But they occurred in three distinct broods from my hibernated larvæ in the proportion of, I think, quite 7 or 8 per cent., though I did not count them. None of the broods were from last year's black pupæ, as they produced only the most ordinary forms of the moth, and were not paired. This year's produced good varieties, following their parents. It did not occur to me either year to pair a couple of moths from the black pupæ, as I now wish I had done, to ascertain whether they would have produced a strain of entirely black pupæ. This could have been done this year from good varieties of the moth, and if a similar opportunity arises again, I hope to do it.'

ROMAN PIERCEBRIDGE.

Mr. Edward Wooler, F.S.A., who has done so much in the interests of archæology in the Darlington District, has just issued a scholarly work entitled ' The Roman Fort at Piercebridge, County Durham ' (190 pp., 10/6 net.). In this he has not only gathered together information derived from innumerable sources bearing upon the past history of Roman Piercebridge, but he has included the results of considerable personal research. The volume has also the advantage of being well-illustrated by a large number of excellent plates.

PREHISTORIC REMAINS.

Mr. Wooler begins with prehistoric remains of the neolithic period, and illustrates a number of relics of the Bronze Age and Iron Age, found at Stanwick. He then deals in turn with the Roman Invasion, the Brigantes, Adrian's Wall, the Erection of the Forts, Roman Roads, the Mills, Bridge, Inscribed Stones, and various other relics from this famous site. We would particularly draw attention to the bronze group of the Roman Ploughmen with oxen, which was found at Piercebridge, and is one of the earliest evidences of agricultural pursuits in this island. Mr. Wooler's memoir includes carefully compiled details of the various descriptions of earthworks, remains of Roman Masonry, Coins, etc., found in the district. He concludes ' The buried cities of the Romans are with us, but their names are gone, and had they not found a grave to preserve their remains, the greatest of all Empires—a nation that dominated Britain for more than 400 years—would not have left a trace to tell the tale of Roman rule, or Roman pomp and power, or the glory, the majesty, and the arts of Imperial Rome ' ; and certainly the author has done his share to interpret the evidence given by these buried relics. We miss an Index, and the work is worthy of a more permanent cover.

THE GEOLOGY OF BOURNEMOUTH.

Notwithstanding the fact that the Geological Survey is being worked at high pressure in connection with the production of important memoirs bearing upon requirements in connection with the war, it is satisfactory to find that it is steadily at work in producing its Memoirs bearing upon the Geology of the different parts of the country. It has recently published the second edition of the ' Geology of the County around Bournemouth,' by H. J. Osborne White, the first edition of which, by the late Clement Reid, appeared in 1898. The present memoir contains 80 pages with illustrations, and is sold at the low price of 2/-. With it is issued a new edition of sheet 329, which is an admirable example of colour printing, 13 different strata being represented. At the bottom of the sheet is a useful section of the country. The map is sold at 1/6.

LINCOLNSHIRE NATURALISTS.

The *Lincolnshire Naturalists' Union Transactions for* 1916 have recently been published, and presumably the present issue is the first part of Vol. IV., as the title page and index of Vol. III. are inserted, though that seems to be the only evidence. It is mindful of the earlier publications of this useful Society, inasmuch as the Rev. E. A. Woodruffe-Peacock is much to the fore. There is his admirable presidential address on the Flora of Lincolnshire, Sequence Sections; he contributes the botanical report for 1916; a note on ' Two Beetles and Two Flies '; he is partly responsible for the Report on the Shells, and, together with Thomas Warner Woodruffe-Peacock, he contributes a paper on Thrush Stone Studies. In addition to the items mentioned it is possible that he wrote the obituary notice of John Hawkins, which includes notes from the Rev. Woodruffe-Peacock's diary. We think that the editors might have appropriately included the Rev. E. A. Woodruffe-Peacock's portrait as frontispiece, though we are very glad to see the illustration of Dr. W. Wallace, who was president some years ago. Other items in the Transactions are ' The Presidents (*sic*) of the L.N.U.' William Wallace; ' The " General " Secretary's Report'; a Paper on the Lias Brickyards of S.W. Lincolnshire, by A. E. Trueman; Reports on Conchology, by W. Denison Roebuck and J. F. Musham; Entomology, by G. W. Mason; Geology, by H. Preston; Vertebrata, by Rev. F. L. Blathwayt; and a note on ' *Laverna epilobiella*,' by G. W. Mason; A Record of the Whiskered Bat in Lincolnshire; and a note on ' A Fungus and its Beetles,' by T. W. Woodruffe-Peacock. We are glad to find that the present conditions have not interfered with the nature of the work of our Lincolnshire friends.

FAIRIES OR BEER?

Notwithstanding the alleged shortage of paper, we find a number of our 'Dailies' devoting half a column or so of their 'valuable space' to such piffle as the following—in one case five lines of large type headings being used:—'UNCANNY HAPPENINGS IN A KENTISH DUG-OUT—ALARMING ADVENTURES —BUILDER'S STORY OF STONES AND TOOLS THAT JUMPED.' It seems that while excavations 'in the form of a cave' were being made in the grounds of a county J.P. in Kent, the excavator states that on one occasion a large stone hit him on the crown of the head, causing a cut (the wound is still visible); on another occasion he received a violent blow on his hand, and again blood was drawn. Then a missile struck him with violence on his right ear. 'Candles were repeatedly extinguished by air and sand, to the accompaniment of a whizzing sound. On several occasions pieces of rock varying from eight to twenty pounds in weight were hurled from one position to another. A lad name Penfold, working with him, states that he saw the stones lift themselves perhaps an inch, then drop again; then about three inches and drop once more. Then they would lift themselves and fall some feet away.'

BOOMERANG TRICKS.

'On another occasion there was a heap of stone at one place, and these would 'fly of themselves' to another position. There were bricks on the floor. These rose apparently of their own volition and were hurled to other positions. Often these did not come in a straight line, but took a semi-circular course.' 'I had two days off,' says the excavator, 'and then, after consideration, I determined to finish the job. On starting again everything went well for a couple of days. After this things became worse. Stones and rocks began to fly about, so much so that an iron stove and iron pipe were smashed to pieces. Then, to crown all, a short bricklayer's hammer weighing about 4 lb. in weight threw itself towards me. The boy Penfold shouted "Look out! perhaps the sledge hammer will move." Hardly had the boy uttered the words than the sledge hammer weighing 14 lb. came over and dropped near with a thud. That is not all. The pickaxe, lying in quite another part of the structure, came for me too, in an ominous manner. There were three chairs, too, on the floor of the cave, and these danced and flew about in the most extraordinary style. If some of those weighty stones had fallen on me probably I should not be here now.' We understand Sir Arthur Conan Doyle and Sir William Barrett are investigating, and that Sir Oliver Lodge is to be invited. We would suggest that the manager of the local brewery and also a well-known member of the Prehistoric Society of East Anglia might be added to this investigation Committee.

Naturalist.

A YORKSHIRE RECTOR OF THE EIGHTEENTH CENTURY.*

Sir ARCHIBALD GEIKIE, O.M., K.C.B., F.R.S., D.C.L.

When the Yorkshire Union of Naturalists honoured me by electing me to be its President for this year, the only, or at least the chief duty of the office being the delivery of an Address at the Annual Meeting, my thoughts naturally turned to the consideration of the subject which might most fitly be chosen as the theme of that Address. It so happened, that for a year or more, I had been engaged in a somewhat extensive enquiry into the lives and work of men of science who flourished in this country during the eighteenth century. Among these worthies there was one whose career greatly interested me. He was highly respected and esteemed by his contemporaries; but subsequent generations have shown less recognition of the wide range of his genius, and the originality and value of his achievements. As he was a Yorkshire Rector, it occurred to me that an account of what this man did for the advancement of science would be a not inappropriate topic on which to address a Union of Yorkshire students of Nature. With this object in view I have made researches in every direction that seemed likely to yield information regarding him and his studies, and I now propose to lay before you an outline of the result of my enquiries.†

John Michell, Rector of Thornhill, a parish in the southern division of the West Riding, was probably born in the year 1724. In the registers of Queen's College, Cambridge, he is entered as from Nottingham. He became a Pensioner of that College in 1742, but did not take his Bachelor's degree until 1748. His name appeared as fourth wrangler in the list for 1748-9, and in the latter year he was elected a Fellow of his College. For some fifteen years he continued to reside at Queen's, where he filled, from year to year, a succession of lectureships in classics and mathematics, and also held the office of Tutor. He obtained his degree of M.A. in 1752 and took a Bachelorship in Divinity in 1761. Having entered holy orders, he was in 1760 appointed Rector of St. Botolph's Church in Cambridge. Thenceforward, to the end of his life, he was an active clergyman who, besides discharging the clerical duties of a country parish, found time to prosecute serious studies in the vast domain of natural knowledge. Over that domain he ranged far and wide, more especially in the fields of physics, astronomy and geology. Gifted with great

* The Presidential Address delivered to the Yorkshire Naturalists' Union, at Wakefield, on December 8th, 1917.

† A more detailed Memoir will appear later.

breadth and originality of mind, he attacked from his own point of view the problems that presented themselves for his consideration, ever striving to gain a personal acquaintance with the underlying facts, and where these were susceptible of experimental treatment, devising ingenious pieces of apparatus for their special investigation. He was thus both a student and a discoverer, and on every department of science in which he worked he left the impress of his originality.

Already, while he was still an undergraduate at Cambridge, his scientific studies had taken practical form. His rooms at Queen's College must have often looked like a workshop, for he was a true experimental philosopher, resolved from the beginning to bring theory, where possible, to the test of actual experiment, and designing and constructing with his own hands the pieces of mechanism that were needed in the course of his investigations. One of the researches on which he was engaged in these College days related to the nature of Magnetism and the production of artificial magnets. The little volume which gave his account of this enquiry appeared in the spring of 1750. At the same time he must have been in the habit of making excursions in many directions across the south of England; thereby acquiring that intimate and accurate knowledge of the geological structure of the country which is conspicuous in his essay on Earthquakes published in 1760.

A contemporary at Cambridge has left a brief description of his personal appearance and reputation, as he lived and moved during his College life :—'John Michell, B.D., is a little short man, of a black complexion, and fat. I think he had the care of St. Botolph's Church, while he continued Fellow of Queen's College, where he was esteemed a very ingenious Man and an excellent philosopher. He has published some things in that way, on the Magnet and Electricity.'*

Before he left Cambridge Michell's name was known far beyond the circles of the University. His investigations in magnetism had attracted attention, and his scientific reputation was greatly increased by the remarkable paper on Earthquakes. Before that paper had been completely read at successive meetings of the Royal Society, he was proposed as a Fellow, and was duly elected on 12th June, 1760. It is worthy of mention that in the roll of membership of the Royal Society the name of John Michell immediately succeeds that of Henry Cavendish. When the Woodwardian Professorship of Geology at Cambridge fell vacant in 1762, it was eminently appropriate that this distinguished Fellow of Queen's should receive the appointment. He was probably the most promising man of science at that time at the University.

* Cole, MSS. xxxiii., p. 156 (Add. MSS. Mus. Brit. 5843).

There is no record of his ever having given a course of lectures on the subject for the furtherance of which the Chair had been founded by Dr. Woodward. But we may well believe that he must often have discussed that subject with his friends, and not improbably he would now and then be accompanied by undergraduates in his geological rambles. Had he retained the professorship, and with it his residence in Cambridge, he would doubtless have prosecuted more extensively the geological studies in which he was interested throughout his life, and the progress of Geology in this country would have been stimulated. But he held the chair for less than two years. It was not tenable by a married man, and Michell in September, 1764, took to wife a Miss Williamson of Nottingham, and left Cambridge, looking forward to a quiet and happy life in a Hampshire rectory to which he had been appointed. In the autumn of the following year, however, he had the great misfortune to lose his wife. He subsequently married again, his second wife surviving him. He left a daughter, probably by the first wife, and apparently his only child. On 3rd October, 1767, he was instituted Rector of Thornhill, and there he continued to live up till his death on 21st April, 1793, in the 69th year of his age.

In the summer of 1871, a popular English journal* published a communication from a contributor who described himself as a great-grandson of Michell, and who gave some particulars relating to the life of the philosopher, derived, as he stated, from his grandmother, Michell's daughter. These particulars, as a welcome addition to the scanty information previously available, have been made use of from time to time, though sometimes with hesitation, in biographical notices of Michell. Some of these family traditions can be shown to be inaccurate. One of them narrates that William Herschel, afterwards the famous astronomer, when he was organist at Halifax used to perform on the violin at musical parties given by the Rector of Thornhill; that he received lessons at Thornhill rectory on the construction of reflecting telescopes, and that he there 'obtained the germs of his great astronomical renown.' The truth is that Herschel had left Yorkshire for a busy life as professional musician at Bath before Michell settled at Thornhill. Not only did the two men not meet at Thornhill in Herschel's musical days, but it would appear that they had neither become acquainted with each other nor exchanged letters up to the spring of the year 1781.† Whether Michell had begun to grind his specula and build his telescopes as early as 1767 may be doubted. But he never gave lessons to Herschel, who with much labour and

* *English Mechanic*, Vol. XIII., p. 310, June 16th, 1871.

† See *Scientific Papers of Sir William Herschel* (1912), Vol. I., p. 32.

patience constructed his own telescope at Bath in the midst of all the distractions of his musical profession there.

The parish of Thornhill in the latter half of the eighteenth century was practically a good deal more remote from the centres of scientific enquiry than it has now become. But its rector in those days made frequent journeys to London, which brought him into personal touch with the Royal Society and its Fellows. He was welcomed to the table of the Society's Dining Club, even before he was elected a Fellow of the Society, and after he became F.R.S., he was so habitually invited that there would seem to have been a kind of friendly competition among the members for the pleasure of securing him as a guest.* For some years he spent several weeks in London every summer, and during his stay he was seldom absent from the Club's weekly dinner at the 'Mitre' in Fleet Street, and subsequently at the 'Crown and Anchor' in the Strand. He thus enjoyed opportunities of discussing with the physicists, astronomers, chemists and naturalists the problems which were engaging his attention.

In our consideration of the scientific work accomplished by this Yorkshire rector, it will be convenient to begin by looking into what he did in the investigation of the crust of the earth, and thereafter to pass in review his contributions to Physical Science and to Astronomy.

I.—Contributions to Geology.

These may be grouped in two sections—first, his observations and deductions regarding the structure of the terrestrial crust; and second, his elucidation of the phenomena of movement in the crust shown in earthquakes.

I.—In Michell's time, Geology had not yet come into existence as a definite branch of natural science. The vaguest and most inaccurate notions prevailed as to the nature and arrangement of the materials that constitute the outer portions of the earth. In particular, the old doctrine was not yet extinct that the organic remains imbedded in the stratified rocks, if they are not mere random 'sports of nature,' but relics of once living organisms, were accumulated among the debris that subsided from the Deluge of Noah. That these remains actually embody a complicated history of the earth's crust, and reveal a vast evolutionary progress, during incalculable ages, from the simplest forms of life up to man himself, was a revelation still undisclosed. Even John Woodward, founder of the Chair of Geology at Cambridge, though he clearly recognised the organic nature of the fossils, could not disabuse himself of the belief that they were all accumulated during

* *Annals of the Royal Society Club*, p. 166.

Noah's Flood. He even held that they had settled down in the diluvial waters according to their relative weight, the heaviest sinking among the lowest sediments, while the lightest remained at the top.

Obviously, one of the first steps towards the elucidation of the matter was to ascertain beyond all question whether, in the portion of the globe accessible to human observation, the materials are tumultuously heaped together as Diluvialists supposed, or have been arranged in some kind of recognisable order. As far back as the early decades of the eighteenth century, John Strachey had shown that in the south-west of England a succession of distinct strata could be traced from the Coal up to the Chalk, and he enumerated them in condensed form, but in their proper sequence. His observations, however, were disregarded by theorists like Woodward. It was needful that some careful student of nature should verify and extend the work done by Strachey.*

Michell's residence in the southern half of England afforded him excellent opportunities of investigating this subject. His excursions from Cambridge and his subsequent journeys between Thornhill and London brought the grouping of the stratified rocks of the region vividly before him, and led him early in life to study their succession. Travelling in those days was more leisurely than now. As he went to and fro across the shires, whether on horseback or by carriage, or in such stage-coaches as then plied on the roads between the Midlands and London, he would often spend two or three days on the way. There is evidence that he kept his eyes open to descry any new pit, quarry or other opening that might have been laid bare since his previous visit. We know, too, that when he halted at an inn for the night he would collect all the fresh information which such removals of the surface soil might reveal. It must be remembered, also, that as the rectory of Thornhill stands on the great Yorkshire Coalfield, the progress of the mining industry around him would continuously bring geological questions to his notice.

It is accordingly interesting to find that while still resident at Cambridge, Michell, as the result of his own personal observations, had arrived at a singularly broad and accurate conception of an important part of the earth's crust.† He found the earth to be ' not composed of heaps of matter casually thrown together, but of regular and uniform strata.' He remarked that ' these strata, though they frequently do not exceed a few feet, or perhaps a few inches in thickness, yet often

* *Phil. Trans.* XXX. (1719), p. 968.

† These observations are contained in the earlier part of his paper on Earthquakes published in the *Philosophical Transactions*, Vol. LI., 1760.

extend in length and breadth for many miles, and this without varying their thickness considerably. The same stratum also preserves a uniform character throughout, though the strata immediately next to each other are very often totally different. Thus, for instance, we shall have, perhaps, a stratum of potter's clay ; above that a stratum of coal ; then another stratum of some kind of clay ; next a sharp grit-sandstone ; then clay again and coal again above that ; and it frequently happens that none of these exceed a few yards in thickness.' The same accurate observer likewise noticed the abundant divisional planes, known now as ' joints ' ; also the occurrence of dislocations or ' faults,' whereby ' the whole set of strata on one side of a cleft are sunk down below the level of the corresponding strata on the other side.' He was aware of the frequently inclined position of the stratified formations, and pointed out that their inclination increases towards the mountains which generally, if not always, are formed out of the lower, and therefore older rocks.

These and other observations detailed in his Earthquake memoir relate, indeed, to some of the more obvious and elementary facts of geological structure, but they had never before been made and described so clearly. They served completely to disprove the theory of tumultuous deposition by the Flood, and they paved the way for the establishment of the principles of stratigraphical geology, based on organic remains, afterwards worked out by the genius of William Smith. But Michell proceeded to build on his accumulated observations a brilliant illustration by which he indicated his conception of the manner wherein, by successive extensive movements and prolonged denudation, the crust of the earth, as he knew it in England, might have acquired its internal structure and superficial aspect. Following his characteristic experimental habit, he proposed the construction of a model which would place his conception in visible form. ' Let a number of leaves of paper,' he said, ' of several sorts or colours, be pasted upon one another ; then bending them up together into a ridge in the middle, conceive them to be reduced again to a level surface by a plane* so passing through them as to cut off all that part that had been raised ; let the middle now be again raised a little, and this would be a good general representation of most, if not all, large tracts of mountainous countries, together with the parts adjacent, throughout the whole world.'

Regret has been expressed that Michell, whose only published geological essay was so remarkable, did not make further contributions to a branch of natural history for which he showed so great an aptitude. Sir Charles Lyell, in referring

* Such a plane would in nature be produced by prolonged denudation.

with just appreciation to his work, was under the belief that from the time when he vacated the Woodwardian Chair, Michell appeared 'to have been engaged in his clerical duties and to have entirely discontinued his scientific pursuits.'* The truth, however, is that far from abandoning science he devoted his leisure to its cultivation more strenuously than ever. Most of his achievements in physics and astronomy were accomplished at his Yorkshire rectory. And even in regard to geological matters, though he did not publish his observations, there is proof that he continued to make them with his accustomed zeal until near the close of his life. He kept up his habit of noting on his journeys any fresh evidence as to the stratigraphy of the districts across which he travelled. In this way he succeeded in making out the broad general succession of formations from the Coal of Yorkshire up to the Chalk. It appears that about the year 1788 he communicated verbally to his friend John Smeaton, the eminent engineer, an account of what he had ascertained to be the sequence of the rocks in the south of England. This account, written down at the time by Smeaton on the first bit of paper that came to hand, was eventually published in the *Philosophical Magazine* for August, 1810. It ran as follows :—

	Yards.
Chalk	120
Golt	50
	Sand
Sand of Bedfordshire	10 or 20
†Northampton lime and Portland limes, lying in several strata	100
Lyas strata	70 or 100
Sand of Newark	about 30
Red Clay, of Tuxford, and several ...	100
Sherwood Forest Pebbles and Gravel ...	50 unequal
Very fine and white sand	uncertain
Roch Abbey and Brotherton limes ...	100
Coal strata of Yorkshire	uncertain

Only an experienced field geologist can appreciate the amount of time and labour which the construction of this table involved, and the wide extent of ground which must have been examined. The key to the sequence of the formations furnished by organic

* *Principles of Geology*, 10th Edit., Vol. I., page 61. The illustrious author of the *Principles* stated that Michell held the Woodwardian Professorship for eight years. In actual fact, as already mentioned, his tenure of the post was less than two years.

† The Portland limestone of the Upper Oolites and the Northampton limestone of the Inferior Oolites belong to different stratigraphical horizons, but they both lie above the Lias. The Keuper and Bunter divisions of the Trias are correctly placed above the Permian Magnesian Limestone.

remains had not yet been discovered. That Michell, without that key, should have been able to work out the stratigraphical succession over the southern half of England with so near an approach to accuracy entitles him to be ranked as the most eminent of the English predecessors of William Smith in this department of geology.

Further interesting proof that the Rector of Thornhill continued to make fresh detailed geological observations until late in life is supplied by a long and still unpublished letter from him to Henry Cavendish, dated 14th August, 1788. This document, together with the draft of the reply to it has been preserved among the Cavendish papers. The correspondence shows that between the years 1783 and 1793 Cavendish, in company with Dr. Blagden, was engaged in tracing the distribution and succession of the geological formations in the southern half of England. In the course of the journeys which this investigation involved, questions arose on which Michell's experience could be of service. When thus appealed to, he, with his usual generosity, gave in ample detail the results of his own observations. His letter to Cavendish, written on his return from one of his journeys to London, told how he had halted for a night at an inn on Greetham Common, and when there, was surprised to find a deposit of clay in the midst of the 'yellow limestone,' of Cavendish and Blagden, or what was afterwards known as the Oolitic series. From his careful description it would seem that this deposit was a patch of the Chalky Boulder-clay of that district, containing scattered flints and pebbles, which he thought might support a conjecture he had formed as to the origin of flints in general. As to the nature of this conjecture the letter is silent. The writer seems to have taken this boulder-clay to be one of the argillaceous bands which are intercalated between the members of the 'yellow limestone,' though he had never noticed it before. In previous correspondence Michell had pointed out that this 'yellow limestone' is underlain by the 'Lyas.' He now insists upon the importance of this sequence which, he says, runs into Leicestershire in the south, and can be traced on the north to where the Trent falls into the Humber, and across the upper part of the Humber. He shows that there is another 'yellow limestone' in his district of Yorkshire, which must lie far below that of Cavendish and Blagden. He points out that there is 'no Lyas anywhere under it or near it to the westward of it, all the way from Leicestershire, by the edge of Nottinghamshire and Derbyshire and a long way into Yorkshire, and how much farther I don't for certain know. In many places, if not everywhere, the coal is found under our yellow limestone, through which they sink in many places to come at it.' Michell had thus traced the extension of what is now

known as the Magnesian Limestone from its southern limit near the vale of the Trent, northwards along the margin of the great coalfield and far into Yorkshire.*

II.—The only contribution made by Michell to the dynamical side of geological science is to be found in the Earthquake paper already quoted which appeared in the *Philosophical Transactions* of the Royal Society for 1760.† The memorable Earthquake of 1st November, 1755, which affected so vast a region, directed general attention to the nature and cause of such violent disturbances in the terrestrial crust. By far the most original and important of the many contributions to the investigation of this subject which at that time appeared, was this Essay by Michell. In preparing it he turned to good use the observations which, as we have seen, he had made during various journeys and excursions from Cambridge across the outcrops of the geological formations in the south of England. He had obviously read widely in the literature of earthquakes and had noted the characteristic phenomena observed in them from ancient times to his own day. With characteristic caution he did not pretend to have certainly found their explanation, and he offered what he had to say on the subject as 'conjectures' only. The explanation which he proposed postulated the existence of what he called 'subterraneous fires,' to which water from above obtained occasional sudden access. It was the general belief in his day that such fires exist and are due to the spontaneous decomposition and ignition of pyritous material in association with inflammable substances such as coal and bituminous shale. In the opinion of many of the leading naturalists of the time, the existence of volcanoes was due to this underground ignition, and the Wernerian geognosts went so far as to maintain that volcanic action must be of comparatively late date in the history of the globe, as, in their view, it could not arise until after vegetation had long flourished on the surface of the earth, and had in places been buried in coal-forming deposits beneath sedimentary accumulations.

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* Michell's letter here quoted concludes with a pleasant proof of the writer's friendship with Henry Cavendish and the members of the Royal Society Club, to whom he sends his 'best respects' and 'due compliments.' He also includes friends at the 'Cat and Bagpipes Club,' which seems to have been a company that included Cavendish and which met in a tavern of that name at the corner of Downing Street.

† The title of this paper deserves to be given in full: 'Conjectures concerning the Cause and Observations upon the Phænomena of Earthquakes, particularly of that great Earthquake of the first of November, 1755, which proved so fatal to the City of Lisbon, and whose Effects were felt as far as Africa, and more or less throughout almost all Europe. By the Reverend John Michell, M.A., Fellow of Queen's College, Cambridge.'

Michell conceived that if a body of water was let down suddenly on one of these tracts of internal combustion, aqueous vapour would be generated, the volume and elastic force of which would suffice to give rise to an earthquake. In the case of volcanoes, the vapour has been able to break its way out to the surface at some weaker parts of the earth's crust, and to project huge blocks of stone to great distances. 'If, then,' he asks, 'when the vapours find a vent, they are capable of shaking the country to a distance of ten or twenty miles round, what may we not expect of them when they are confined?' He distinguished two kinds of motion in an earthquake, one tremulous over the centre of disturbance and for some some distance around, the other undulatory in a succession of waves that extend much further than the tremulous movement. 'As a small quantity of vapour, almost instantly generated at some considerable depth below the surface of the earth, will produce a vibratory motion, so a very large quantity (whether it be generated almost instantly, or in any small portion of time) will produce a wave-like motion.'

In illustration of what he conceived to be the manner in which the wave-like motion is propagated, he supposed a large carpet to be spread upon a floor, and after being raised at one edge, to be suddenly brought down again to the floor. 'The air under it being by this means propelled, will pass along, till it escapes at the opposite side, raising the cloth in a wave all the way as it goes.' He believed that as the air travels along under the carpet which it uplifts in its progress, so 'in like manner a large quantity of vapour may be conceived to raise the earth in a wave as it passes along, between the strata, which it may easily separate in an horizontal direction, there being little or no cohesion between one stratum and another. The part of the earth that is first raised, being bent from its natural form, will endeavour to restore itself by its elasticity, and the parts next to it, beginning to have their weight supported by the vapour which will insinuate itself under them, will be raised in their turn, till it either finds some vent, or is again condensed by the cold into water, and by that means prevented from going any farther.' (Art. 58).

In volcanic districts, the sheets of water which often accumulate in extinct craters, may occasionally be suddenly precipitated into the region of the molten magma below, with the consequent generation of much aqueous vapour. It is conceivable that this vapour may force its way for some distance between the planes of easily separable strata. The minor earthquakes in volcanic regions may sometimes be due to this cause, which, however, cannot be accepted as the cause of earthquakes in general. But though Michell's 'conjecture' is set aside, we should not fail to note that in making it he has

the credit of having first suggested the potency of subterranean aqueous vapour as a dynamical agent. A study of the Sills or intrusive sheets, which are so abundant in the British Isles, shows that the horizontal injection of the internal magma (which owes its propulsive energy to the aqueous and other vapours which it holds in solution under enormous pressure and at a very high temperature) has sometimes taken place on a gigantic scale. The Great Whin Sill of the North of England, a mass of once molten rock, averaging 80 or 100 feet in thickness, has been injected between and across the Carboniferous strata over a distance of at least 80 miles, possibly at successive intervals of intrusion. Such enormous inthrusts of the magma charged with its explosive vapour could hardly fail to be accompanied by violent earthquakes.

But in the case of most earthquakes it is not to this cause that we must look for the explanation of their origin. Michell undoubtedly suggested a *vera causa* which may sometimes be displayed in volcanic regions. He was probably influenced by his familiarity with the little disturbed stratified formations of the south of England, when drawing his analogy from the air wave under the uplifted carpet, he conceived that vapour suddenly generated at some depth from the surface of the earth would force its way for a long distance between the planes of stratification. But the crust of the earth is not everywhere so regularly arranged as in the southern counties. Over wide tracts it is much more complicated and almost everywhere it is dislocated by faults by which strata, otherwise undisturbed, have their continuity seriously interrupted.

Much thought has been bestowed on the study of earthquakes since Michell's time, and a much clearer conception has been formed of their cause and their phenomena. The terrestrial crust is subject to enormous stresses under which it is apt here and there to give way Any such snap or fracture starts a series of elastic waves which travel outwards in all directions and are felt as an earthquake at the surface. Probably the great majority of earthquakes are due to this cause.

Michell recognised that earthquake shocks are propagated in successive waves in progressively lessening amplitude through the solid earth. He also pointed out how the centre of disturbance could be determined: 1st, by observation of the different quarters from which the shock arrives at a number of distant places, the common intersection of lines drawn in these directions showing the position of the centre; 2nd, by noting the time of arrival of the shock at different places, and 3rd from the successive hours of arrival of the great sea-wave. Employing these methods he computed that the focus of the Lisbon earthquake lay under the Atlantic Ocean at a distance of a degree of a great circle from Lisbon, and a degree and a half from Oporto.

Still more remarkable was the sagacity which led him to suggest the comparatively slight depth underneath the surface at which a severe earthquake might start. As what he calls a 'random guess,' he supposed that the depth of the focus of the Lisbon disturbance 'could not be much less than a mile, or a mile and a half, and probably did not exceed three miles.' At the time he wrote hardly any data existed on which to base an opinion on the subject. During the last century considerable attention was devoted to this section of seismology. By different methods of computation the depth of origin has been found to vary up to about fourteen miles. These estimates seem to indicate that earthquakes take their rise at various depths, but generally, if not always, in the comparatively superficial parts of the terrestrial crust, as Michell was led to suggest.

From what has now been stated our Yorkshire rector must be admitted to have been an original genius, gifted with insight which placed him much in advance of his time in regard to studies that would now be classed as part of geological science. His modesty led him to undervalue the importance of his observations and to refrain from publishing a large part of them, though he was evidently ready at any moment to place them at the service of any inquirer interested in the subject. He was a great geological pioneer, and assuredly the most accomplished English geologist of his day.

II.—Contributions to Physical Science.

It was, above all, in the realm of the physical sciences that John Michell accomplished his most original and brilliant work. While still in residence at Queen's College, he entered on the practical study of Magnetism, and when only six and twenty years of age, published his treatise on Artificial Magnets. This little volume, besides setting forth the method which he had devised for producing these magnets, contained the results of his investigation of the phenomena of magnetism. He found that Magnetical attraction and repulsion are exactly equal to each other and that 'the attraction and repulsion of magnets decreases as the squares of the distances from the respective poles increase.' This discovery, now recognised as 'the basis of the mathematical theory of magnetism,'* was stated by him with his characteristic modesty. He would not lay it down as certain until further experiments had been made, but his work as far as it had gone, made the conclusion highly probable.†

The year 1767, which saw Michell settled in his Yorkshire

* Whittaker, *History of Theories of Aether and Electricity*, p. 55.
† *Treatise of Artificial Magnets*, p. 19.

rectory, likewise brought to Leeds, only a few miles from Thornhill, the eminent Joseph Priestley, whose reputation as a dissenting minister, and also as a man of science, had already made him widely known. He had been elected the year before into the Royal Society, and this year he published his *History and Present State of Electricity*. It was natural that two philosophers, having so many interests in common and living so near each other, should soon become acquainted. Michell was too generous and liberal-minded to allow the popular prejudice against the unorthodox clergyman at Leeds to stand in the way of their friendly intercourse in science. During the next five years, they saw much of each other, besides carrying on an active correspondence on scientific questions. Priestley has put on record that at this time he frequently visited the rector of Thornhill, and 'was very happy in his society.' In 1772, he published his two quarto volumes on the *History and Present State of Discoveries relating to Vision, Light and Colours*, in the preparation of which he freely acknowledges how much he owed to Michell's assistance. The information which he affords regarding this assistance, throws interesting light upon Michell's views on a number of physical problems which he had considered, but on which he had never published anything. The intercourse of these two philosophers furnishes another example of Michell's habitual generosity and helpfulness in the cause of science.

Priestley appears to have been impressed by the skill shown by the rector in devising and constructing apparatus for the purpose of illustrating or solving physical problems. In particular, he alludes to an endeavour made by his friend to ascertain experimentally, the momentum of light in a more accurate manner than had previously been proposed. The apparatus, which he describes, was disordered by the experiment, but the attempt of its designer, Priestley remarks, 'was not wholly without success, and the conclusions that may be drawn from it are curious and important.'* He then shows that these conclusions which Michell was disposed to draw, pointed to the 'mutual penetrability of matter.' The account of these inferences had best be given in Priestley's own words: 'The ingenious hypothesis of Boscovich on this subject, or at least one that is the same in everything essential, also occurred to my friend, Mr. Michell, in a very early period of his life, without his having had any communication with M. Boscovich, or even knowing that there was such a person. These two philosophers had even hit upon the same instances, to confirm and illustrate their hypothesis, especially those relating to contact, light and colours.

* Discoveries in Vision, Light and Colours, p. 357

'This scheme of the *immateriality of matter*, as it may be called, or rather the *mutual penetration of matter*, first occurred to Mr. Michell on reading Baxter on the *Immateriality of the Soul*. He found that this author's idea of matter was, that it consisted, as it were, of bricks, cemented together by an immaterial mortar. These bricks, if he would be consistent to his own reasoning, were again composed of less bricks, cemented, likewise, by an immaterial mortar, and so on *ad infinitum*. This putting Mr. Michell upon the consideration of the several appearances of Nature, he began to perceive that the bricks were so covered with this immaterial mortar, that if they had any existence at all, it could not possibly be perceived, every *effect* being produced, at least, in nine instances in ten certainly, and probably in the tenth also, by this immaterial, spiritual and penetrable mortar. Instead, therefore, of placing the world upon the giant, the giant upon the tortoise, and the tortoise upon he could not tell what, he placed the world at once upon itself; and finding it still necessary, in order to solve the appearances of Nature, to admit of extended and penetrable immaterial substance, if he maintained the impenetrability of matter; and observing further, that all we perceive by contact is this penetrable immaterial substance and not the impenetrable one, he began to think he might as well admit of *penetrable material*, as well as *penetrable immaterial substance*, especially as we know nothing more of the nature of *substance*, than that it is something that supports *properties*, which properties may be whatever we please, provided they be not inconsistent with each other; that is, do not imply the absence of each other. This by no means seemed to be the case in supposing two substances to be in the same place at the same time, without excluding each other; the objection to which is only derived from the resistance we meet with to the touch, and is a prejudice that has taken its rise from that circumstance, and is not unlike the prejudice against the *Antipodes*, derived from the constant experience of bodies falling, as we account it, downwards.'*

Like the philosophers of his day, Michell believed in the Newtonian theory of light, that it was due to the projection of corpuscles from a luminous source. He suggested that the twinkling of the fixed stars may arrive from the small number of such corpuscles received by the eye, perhaps only a few per second. These speculations acquire much interest as 'a curiously definite foreshadowing of the work on electric radio-

* Priestley, *op. cit.* pp. 392-3. As Professor Whittaker has pointed out, Faraday's suggestion that 'an ultimate atom may be nothing else than a field of force—electric, magnetic and gravitational—surrounding a point centre, is substantially the view of Michell and Boscovich. *History of the Theories of Aether and Electricity* (1910), p. 217.

activity in which Thomson, Rutherford and others have actually controlled the velocities of the electric corpuscles by the agency of field of force and have directly counted the numbers of them that are shot out from active matter.'*

Reference has already been made in the foregoing pages to the ingenuity and inventiveness shown by John Michell in devising and constructing apparatus for the investigation or demonstration of physical problems. By much the most famous of these pieces of mechanism was the Torsion-balance with which he proposed to determine the mean density of the globe. This appears to have been one of his latest inventions; at least, he died before he was able to put it into use. After his death it passed into the hands of his friend, Henry Cavendish, who, after making some modifications in it, put it to the purpose for which its author designed it. The first successful employment of the balance came to be universally known as the 'Cavendish experiment,' but Cavendish was careful to make it clear that the design and construction of the original mechanism were due to the Yorkshire rector. The idea of the inventor was to devise a method whereby it would be possible to measure 'the force of gravitation between two spheres of such small size that they could be moved by the hand nearer to or further from one another. The essential part of the invention was to contrive a balance so delicate as to measure the almost inappreciable tendency of such bodies to unite. Newton had shown that the attraction at the surface of any sphere is directly as its radius, which, he observed, must always be incomparably smaller than their tendency towards the earth; that is, their weight. In the largest and heaviest masses with which it had hitherto been found practicable to operate, this tendency amounts to only a very minute fraction of a grain. How could such quantities be *accurately* estimated, so as not only to leave no doubt of the phenomenon of gravity thus acting on the small scale, but to reduce its amount and hence to weigh the globe?' †

This feat was accomplished by Michell's Torsion-balance in the hands of Cavendish. The result of the Cavendish experiment showed the mean density of the earth to be 5·48 times that of water. The experiment has since been several times repeated with increased delicacy of mechanism. The latest repetition was that of Mr. C. V. Boys, F.R.S., who, employing fine quartz fibres instead of metallic wires, found the density to be 5·5270,‡ Michell's invention has now become

* Sir Joseph Larmor's MS.

† J. D. Forbes, Sixth Dissertation of the Eighth Edition of the *Encyclopædia Britannica*, p. 834.

‡ *Phil. Trans*, Vol. 186 (1896).

an instrument of supreme value in physical research seeing that it affords the standard method for the determination of very small forces.

III.—Contributions to Astronomy.

Probably from an early period in his career Michell included in the wide circle of his pursuits the practical study of the heavens. His earliest communication to the Royal Society was made in the year 1760 and had for its title 'Observations on the Comet of 1760.'* He constructed his own reflecting telescope, and put it to such good use as enabled him to make important additions to astronomy. His papers in this department of science are marked by the same originality of conception which, as we have seen, is so manifest in his other researches. They gained for him the respect and esteem of his contemporaries, but their merit and the remarkable prescience wherewith he sometimes foreshadowed in them some of the discoveries of later generations have not until recently been perceived.

Especially memorable is the paper which he read to the Royal Society in 1767, with the title of 'An Enquiry into the Probable Parallax and Magnitude of the Fixed Stars, from the quantity of Light which they afford us and the particular circumstances of their situation.'† This memoir affords striking evidence of its author's prowess both as a careful observer of fact, and as a philosopher who could discuss with great breadth of view, perspicacity and originality the problems which the observations presented. He was here the first to suggest that the close proximity of the constituent members of double stars is owing to some physical connection existing between them. He likewise initiated the employment of mathematical methods depending on probability and statistics in the discussion of the theory of the distribution of the stars in the firmament.‡ His important discovery of the existence of stellar groups was appreciatively acknowledged by his great contemporary William Herschel, who referred to Michell's 'elegant proof of it on the computation of probabilities.'§

In a subsequent paper which took the form of a letter to his friend Henry Cavendish, and was published in 1784,‖ 'he expressed his firm conviction that the double and triple stars discovered by Herschel were so many systems of stars, so near to each other as to be liable to be affected by their mutual gravitation, and he considered it as not unlikely that the periods of the revolutions of some of these about their principals

* *Phil. Trans.*, Vol. 51, p. 466.
† *Phil. Trans.*, Vol. 57, p. 234.
‡ R. Grant, *History of Physical Astronomy*, p. 559.
§ *Phil. Trans.*, Vol. 75 (1875).
‖ *Phil. Trans.*, Vol. 74 (1784), p. 35.

might some time or other be discovered.'* a prediction which was afterwards verified by the brilliant star-work of Herschel.

Again, Michell in his memoir of 1767 was the first to publish correct views in regard to the telescopic visibility of small stars, which he showed to be dependent on the area of the aperture of the instrument. 'Assuming the diameter of the pupil of the eye to be equal to one third of an inch, and roughly estimating the quantity of light lost in passing through the telescope, he was enabled to compare the distance of the faintest stars seen in a telescope of given aperture, with the distance of those barely visible to the naked eye.'† The principle thus initiated by him for estimating the distribution of stars at different distances in the depths of space was afterwards successfully employed by Herschel.

From the outline which I have now given of the scientific labours of John Michell it will be apparent that he must have been a singularly gifted philosopher. Among his contemporaries during the latter half of the eighteenth century he seems to stand out as conspicuous for the wide range of his investigations, and for the originality both of his methods of research and of the views to which they led him. Moreover, he is now seen to have possessed the faculty of reaching, in more than one branch of enquiry, intuitions which curiously anticipate results arrived at by later generations. On every line of research which he entered he left the mark of his genius. His mechanical skill enabled him to devise and construct with his own hands the instruments or apparatus with which he could experimentally illustrate or test the theoretical conclusions to which he came. In Geology, in Physics, and in Astronomy, he was a true pioneer.

With all this capacity for original research of the highest quality, he combined in no common degree the gifts of modesty and caution. Even when tolerably certain of the soundness of a deduction, he would not go farther than to state its probability, until he could, where possible, demonstrate its certainty by careful experiment. He was never in a hurry to publish his observations, though ever ready to communicate them to a fellow-worker interested in the same branch of enquiry. There can be little doubt that much of his quiet work at Thornhill rectory was never published. He pursued science as a pure labour of love. For personal credit or fame he appears to have cared little. Though he stood high in the esteem of his contemporaries, it would seem that his distinction has been somewhat overlooked by his successors, and that some of his discoveries have been attributed to others.

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* R. Grant. *op. cit.*, p. 559.
† Grant, *op. cit.*, p. 543.

So far as I am aware, no attempt has hitherto been made to present a general review of the whole range of his contributions to science. Such a review I have endeavoured to give in outline in the present Address. Michell was assuredly a man whose name merits a prominent niche in the temple of British science, and in Yorkshire where he lived so long, and where most of his work was done, his memory deserves to be cherished as that of one of the most notable scientific worthies of whom the county can boast.

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Thrush Feeding on *Limnæa stagnalis*.—Although it is on record, and generally known, that the Thrush feeds on 'Land Snails,' obtaining the mollusc by means of breaking the shells, I have so far failed to find any record of this bird feeding on aquatic mollusca. It may therefore be of interest to place on record that on August 21st, 1904, while 'naturalising' at a pond near 'Skirbeck' in Maidenwell parish, near Haugham Church, I observed a thrush step into the water and fetch out large specimens of *Limnæa stagnalis* that were at the surface of the water near the edge of the pond, and take them to a stone to break the shells and then proceed to eat the molluscs. I afterwards went to see the slaughter-stone and was surprised to find a quantity of broken *L. stagnalis* shells.—C. S. CARTER, Louth.

Bean Geese as 'Gabriel's Hounds.'—I have no doubt that some of your readers will have heard of the legend of Gabriel and his hounds, who may be heard at long intervals of many years driving his pack at full cry through the skies. I know a gamekeeper who, on the 28th November, this year, witnessed this occurrence. He was standing, a little after sunset, at the side of a pond and was much surprised to hear what he took to be a pack of hounds in full cry, and, on looking up, saw passing overhead a flock of bean geese, about 20 to 30 in number, making a noise which exactly resembles the cry of a pack of hounds. It would be interesting to know if any of your readers observed or heard the same thing on the same date. The flock was flying low and struggling hard against a strong head wind. One can quite understand that many who have heard this sound, and not seen the cause of it, would put it down to supernatural agency. The last occasion on which the same gamekeeper had a similar experience was thirty years ago, when he heard the noise but could not make out the cause of it.—Anon., Lincs., November 30th, 1917.

[This is a very popular superstition and was prevalent all over the country. Nelson mentions it in his 'Birds of Yorkshire.' It would be interesting to know how our correspondent was able to identify the birds as Bean Geese ?]—ED.

HELIX CARTUSIANA AND HELIX SYRIACA:

Their Relationship and its Probable Significance.

J. W. TAYLOR, M.Sc.

Helix (*Theba*) *syriaca* as evidenced by specimens from Samos, near Smyrna, and Mount Carmel, Palestine, for which I am indebted to Mr. J. R. le B. Tomlin and Rev. Canon Horsley respectively, indicate that though undoubtedly closely allied to our British *H. cartusiana*, still show sufficient divergence to entitle it to an independent status.

The *H. syriaca* is characterized by the usually total closure of the umbilicus, by the comparatively distinct reticulate whorl-sculpturing, the somewhat flatter basal peristome, and the presence of a broad and distinct darker band above the periphery with a similar though less persistent one beneath, separated by a white, calcified, peripheral zone.

On the other hand, the West European and Mediterranean examples of *H. cartusiana* show a white or whitish shell, frequently clouded about the aperture with brown, but occasionally showing faint vestigial traces of a white and somewhat cretaceous peripheral band.

The Samos and Samarian shells demonstrate and confirm the accuracy of the explanation that the feeble indications of the somewhat opaque peripheral zonulation in *H. cantiana* *H. cartusiana*, etc., are the relics of the white and calcified space separating the formerly existent upper and lower group of bands, which have been lost by those species, but are still retained by *H. syriaca*.

This palpable relationship of our *H. cartusiana* with *H. syriaca* displayed by the retention of the primitive band arrangement by the latter, is indicative of their phylogenetic affinity, and the truth of the axiom laid down by the immortal Darwin that new species arise because the differences they acquire confers some advantage over the more primitive forms from which they have arisen, and that they will therefore inevitably crowd out and supplant their progenitors from the active evolutionary area and compel their migration to other regions.

We are thus led to the conclusion that—Europe being probably the original source and metropolis of the most advanced forms of life and the area of the greatest development and concentration of the central nervous system, while a decreasing degree of dominating power is demonstrable as we recede towards or beyond its confines, so that the oldest or most primitive forms, if not isolated in undesirable regions, are necessarily the farthest removed from the original home of the groups.

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We are therefore justified in assuming that the internal structure, which is usually the last to be affected by evolutionary change, will, in the case of *H. syriaca*, show the dart sacs of the reproductive system to be in a more primitive and functional condition than in the later developed *H. cartusiana*, and that possibly traces may be still perceptible of the initiation of the transformation of the crystalline love-dart and its accessories into the sarcobelum or muscular excitatory organ, as now possessed by *H. cantiana*, and which, in *H. cartusiana*, are in an interesting intermediate stage leading up to the development of a similar organ.

The careful investigation and exposition of the anatomical structure of *H. syriaca* would be of considerable interest, and would probably confirm the soundness of this phylogenetic study and increase the disproofs of those ancient beliefs still held by some scientists as to the location of the chief evolutionary area in Central Asia or in other weak and unlikely regions.

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Tree Sparrow near Sheffield.—Although I have always assumed the presence of the Tree Sparrow in my garden, it was not until yesterday that I had the pleasure of handling two specimens netted the previous night in the shrubberies. On close acquaintance the small size, chesnut head and black patches behind the eyes rendered identification a simple matter, especially when comparing them with a male House Sparrow captured at the same time in the ivy on the house. The fact of the plumage of the male and female being practically identical in this species is both curious and interesting. To anyone not acquainted with this peculiarity they would all appear to be cocks.—W. A. Durnford, Elsecar, Nov. 20th, 1917.

A Large Flock of Magpies.—On November 16th, a friend of mine, walking along the lane leading from Adel to Horsforth, had his attention attracted by a considerable amount of chattering, and was surprised to see a large flock of Magpies congregated together in a large thorn tree; upon his approach they flew away in twos and threes, so that he was able to count them accurately—there were thirty-two. It is recognised that the near neighbourhoods of some of our larger Yorkshire towns have provided secure breeding places for Magpies, where they are not disturbed by the game-keepers' traps or guns. I think it has not been given to many to see so large a flock of this handsome, but mischievous, bird. On the upland in my own neighbourhood Magpies have increased considerably during the last two or three years, no doubt as a result of the wretched war.—R. Fortune.

HEMIPTERA-HETEROPTERA OF WEST CUMBERLAND.

JAS. MURRAY,
Carlisle

I spent the first ten days of last July at Seascale, on the south-west coast of Cumberland. The weather throughout was gloriously fine, so, although rather early in the year for many species of Hemiptera, I met with a fair measure of success. The only Pentatomid met with was *Dolycoris baccarum* Linn., and that in the nymphal stage only, but easily recognised by its hairy appearance. It occurred under Rest Harrow on the sandhills. Of the Coreidæ, a specimen of *Myrmus miriformis* Fall., was obtained by evening sweeping in a marshy meadow near Drigg. This is new to Cumberland. A larva in last instar of *Neides tipularius* Linn., was found on the sandhills near Seascale. In the same locality, under the Rest Harrow *Metacanthus elegans* Curt., was common, larvæ, and mature examples of both sexes. The active little Bug, *Nysius thymi* Wolff. was common in some of the sand pits on the golf course. *Velia currens* Fab., a few on a small stream near Cleator. The only *Nabis* was *N. flavomarginatus* Schotz., which was common in Eskdale. *Salda C-album* Fieb., and *Salda saltatoria* Linn., on mud by side of a pond near Seascale. A few specimens of *Anthocoris confusus* Reut. were obtained at Cleator. *Pithanus maerkeli* H.S. was commonly swept in Eskdale. *Miris calcaratus* Fall., common at Seascale; *Megaloceræa ruficornis* Fourc., common both at Seascale and in Eskdale. A few *M. psammæcolor* Reut. on the Seascale sandhills. *Leptopterna ferrugata* Fall. swarmed at Seascale, where L. *dolobrata* Linn. was not seen. Both species were equally common in Eskdale. *Monalocoris filicis* Linn. was swept from ferns both at Seascale and Eskdale, *Bryocoris pteridis* Fall. also occurring in the latter locality. Sweeping along a lane in Eskdale produced a nice set of *Lopus gothicus* Linn., one specimen with the pronotum and cuneus black is therefore referable to the variety *superciliosus* Linn. This is also new to our county list. *Calocoris sexguttatus* Fab. and *C. bipunctatus* Fab. were common in Eskdale. *Lygus pabulinus* Linn., not uncommon, Eskdale and Cleator. *Rhopalotomus ater* Linn. Seascale and Eskdale, common. *Orthocephalus saltator* Hahn. on Rest Harrow, Seascale. *Strongylocoris leucocephalus* Linn., Seascale, common. *Heterocordylus genistæ* Scop., common at Seascale and Drigg. *H. tibialis* Hahn at Holm Rook, not common. *Macrotylus paykulli* Mey., was very common all along the coast. *Phylus melanocephalus* Linn., Eskdale, on Oak. The only Psallus out was *P. lepidus* Fieb., of which I

beat three from Ash at Holm Rook. These are the first Cumberland specimens. *Plagiognathus* was represented by two common species, *P. chrysanthemi* Wolff and *P. arbustorum* Fab. *Asciodema obsoletum* D. and S. was abundant on Furze at Seascale. A visit during August or September would probably add considerably to this list.

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BOTANY.

***Nierembergia gracilis* and *Sisymbrium altissimum* at Theddlethorpe Sandhills.**—When botanising in August, 1916, on the Sandhills at Theddlethorpe, my friends the Misses Nash found two plants unknown to them which they sent to Kew Gardens for identification. The plant found by Miss F. M. Nash was identified by the Kew authorities as '*Nierembergia gracilis*, Hook., a native of temperate South America, (?) new to Britain.' The other plant, found by Miss H. M. Nash, was indentified as *Sisymbrium altissimum* Linn., and is believed to be new to the district.—C. S. Carter, Louth.

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ARCHÆOLOGY.

Prehistoric Remains at Doncaster.—It would perhaps be agreeable to Mr. Sewell to know that, up to twenty years ago, there was hardly a record of any Flint implement found in the Doncaster district, when the Archæological Section of the Doncaster Scientific Society took up the matter in earnest, and explored the district with fair success, and in all directions. From the town, stone implements have been found, consisting of polished axes, scrapers, knife, arrow heads, flint discs; a flint core from which implements have been chipped; also many flint flakes. In addition, a number of cinerary urns of very primitive design, pointing to the very early occupation of this district by primitive and neolithic man. Every care is now taken with any find which comes to light that links up the unwritten history of our district. It is evident we had a fairly large population of neolithic people in the Doncaster district, though nothing like that of the East Coast country. There was a large Settlement at Hooton Roberts, six or seven miles from Doncaster, where very many implements have been found. Your readers may care to know that in the ancient village of Haxey, about twelve miles from Doncaster, they still cultivate the long narrow strips of land. One strip is called a 'land,' two, 'two lands,' and so on. Tradition in the village says there is no beginning to their history, as they have been so cultivated from times before written history began.—A. Jordan, Claremont, Doncaster.

YORKSHIRE NATURALISTS AT WAKEFIELD.

THERE was a heartiness throughout the whole of the proceedings connected with the Fifty-sixth Annual Meeting of the Union held at Wakefield on Saturday, December 8th last, that spoke well for the future welfare of the Union, when more normal times return. The absence of their distinguished President, Sir Archibald Geikie, O.M., K.C.B., LL.D., through illness, was much regretted, as the presence of his stimulative personality would naturally have added to the enjoyment of the gathering.

In the morning a large party, under the guidance of Mr. H. Pollard, visited, by the kind permission of Mrs. E. J. Simpson, Walton Park, famous as the residence of the late Charles Waterton, an eminent Yorkshire naturalist. The members were conducted over the grounds by Mr. E. T. B. Simpson, and much enjoyed the visit under his able guidance. Members who arrived later inspected the Chantry on the Bridge, the field of the battle of Wakefield, Sandal Castle, and subsequently the Cathedral and County Hall, under the guidance of Messrs. C. T. Wilby, James Reyner and W. Holmes.

After the Sectional Meetings there was an exceptionally well attended gathering of the General Committee, twenty-eight of the Affiliated Societies being represented. The meeting was held in the Council Chamber at the Town Hall, Prof. P. F. Kendall, M.Sc., occupying the chair. The report of the year's work was fully considered, and the gratifying announcement by the Hon. Treasurer, Mr. Edwin Hawkesworth, that the financial position of the Union was in a sound condition, the year's working again showing a balance to the good, was received with applause. The recommendation of the Executive that the Excursions should be continued also received general approval, and their suggestions for the places to be visited during the coming year were agreed to. The announcement that, on the invitation of the Executive, Prof. W. Garstang, M.A., Sc.D., F.Z.S., of Leeds, had accepted the Presidency of the Union for 1918, was cordially received.

The Secretaries stated that Mr. R. C. Fowler Jones of York had presented to the Union an elaborate and carefully compiled index of the Excursion Circulars issued by the Union since 1877; the index also included the Societies which had been affiliated with the Union, and of its past Presidents. Thanks were accorded to Mr. Jones for his gift.

After a brief interval, the Annual General Meeting of the Union was held, the attendance being excellent.

Prof. Kendall again presided, and had the support of the Mayor of Wakefield, Councillor George Blakey, J.P., Colonel E. A. Brotherton, J.P., the President of the Wakefield Paxton Society, Canon Welch, the Vicar of Wakefield, and officials of the Union.

The Mayor welcomed the members on behalf of the citizens of the ancient City of Wakefield, remarking that this was the third occasion upon which the Union had held its annual meeting at Wakefield, the first time being on the 6th October, 1877.

The Presidential address of Sir Archibald Geikie was read by Prof. Kendall, the subject being 'A Yorkshire Rector of the Eighteenth Century.' The address contained the result of his extensive enquiries into the career and scientific labours of an eminent Yorkshire Scientist, the Reverend John Michell, Rector of Thornhill, near Wakefield, who resided there from 1767 to the time of his death in 1793. The result of these enquiries showed how extensive was the range of the investigations of this Rector of Thornhill, and especially how true were his pioneer achievements in Physics, Astronomy, and Geology. The address will appear in the pages of *The Naturalist.*

A vote of thanks was accorded to Sir Archibald Geikie for his address, on the proposition of Dr. Forsyth, President of the Yorkshire Geological Society, seconded by Mr. A. Gilligan, B.Sc., Secretary of the same Society. Votes of thanks were also accorded to the Wakefield Corporation for the use of the rooms at the Town Hall, to the Mayor of Wakefield for light refreshment, and to Mr. H. G. Townsend for making the local arrangements; to the Wakefield Naturalists' Society, Wakefield Paxton Society, and Wakefield Photographic Society for their entertainment, and making the meeting the great success it was. Col. Brotherton responded on behalf of the Wakefield Paxton Society, and Mr. H. V. Pollard on behalf of the Wakefield Naturalists' Society. The concluding resolution, most heartily carried, to Prof. Kendall for his services, was moved by Canon Welch, seconded by Prof. Garstang.

After this meeting, a pleasant evening was spent at the Town Hall. One room was set apart for exhibits, the contributors thereto being as follows:—Mr. F. W. Tattersall, architectural views of the cathedrals of Wakefield, Norwich and Ely, and landscape views in the neighbourhood of Settle and the Wharfe Valley; Mr. A. Pickard, views of old Wakefield, York Minster, and Bolton Abbey; Mr. H. G. Townsend, views of York Minster and Beverley; Mr. J. B. Butterworth, old fire-arms and helmets, and cases of foreign lepidoptera and coleoptera; Mr. C. W. Halden, armour co-incident with the Battle of Wakefield; Mr. George Wadsworth, eggs of the Ostrich and Emu, petrified bird's-nest and eggs, photographs of Australian natives, and British agricultural grasses; Mr. H. V. Pollard, cases of English birds; Mr. George Parkin, a splendid series of mounted British grasses, club-mosses, mosses and lichens; cases of insects, chiefly Diptera and Hymenoptera,

and a case of Galls. Alien Yorkshire Mollusca which had been collected at Wakefield were shown by Mr. J. A. Hargreaves and Mr. J. D. Firth; specimens collected at Elland by Mr. J. E. Crowther; and specimens collected at Selby by Mr. J. F. Musham. A particularly striking exhibit was a series of microscopic sections of the Barnsley Bed Seam, from the Hickleton Main Colliery, Barnsley, together with coloured photographs of the same, which had been presented to the Leeds University by Sir Wm. Garforth, LL.D.

Mr. C. A. Cheetham contributed a series of his coloured slides illustrating the Flora of the Carboniferous Rocks; Mr. George Parkin, a series of hand-coloured slides, the work of Miss Parkin, illustrating members of the Order Roseaceæ; also his unique series of frost slides and snow scenes. The whole of these slides were admirably displayed upon the screen by Mr. Harold Parkin, and thanks were accorded to the contributors for their entertaining value.

W.E.L.W.

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In *The Geological Magazine* No. 640, Mr. A. E. Trueman has 'Observations on Polymorphites.'

The Journal of the Board of Agriculture for November contains a paper on Insects Pests of Basket Willows.

An excellent portrait of the late Prof. Edward Hull appears in the *Geological Magazine* for December.

The Board of Agriculture and Fisheries Leaflet No. 299, deals with the "Storage of Potatoes and Other Vegetables for Winter Use.'

For the first time a lady (Miss M. Masterman, M.Sc.) has been elected President of the Leeds Naturalists' Club and Scientific Association.

The Quarterly Journal of the Geological Society, No. 287, contains three papers dealing with the Geology of Perak, Orange Free State, and Mozambique.

The Editor of *British Birds*, Mr. H. F. Witherby, has accepted a commission in the R.N.V.R., and the Magazine will be continued during his absence.

The death is announced of the Rev. H. A. Powys, the Vicar of Meanwood. He was for many years a member of the Yorkshire Naturalists' Union and some years ago frequently attended the field excursions.

The Proceedings of the Geologists' Association, Vol. XXVIII., Part 3, are almost entirely occupied by a paper on 'The Post-Pliocene Non-Marine Mollusca of Ireland,' by A. S. Kennard and B. B. Woodward.

Prof. P. G. H. Boswell's inaugural address in connection with the Herdman Chair of Geology at the University of Liverpool was given on November 16th, on 'Sands: considered Geologically and Industrially under War Conditions.'

The Tenth Annual Report of the National Museum of Wales contains an admirable reproduction of a 'Relief Portrait of the Late Dr. C. T. Vachell, by Sir W. Goscombe John, R.A., to be erected in the New Building. Presented by the Cardiff Naturalists' Society.' There are other illustrations and descriptions of interesting additions made during the year, the list being a formidable one. Considerable progress is reported in the Natural History Department.

FIELD NOTES.

MOLLUSCA.

***Helicella gigaxii* in Lincolnshire.**—Mr. C. Oldham recently directed my attention to the specific characters of *H. gigaxii* differentiating it from *H. caperata.* I at once turned out my small and long neglected collection of the latter species, amongst which I found several examples of *H. gigaxii*, collected, in 1904, at Redhill near Goulceby; these were almost identical with examples sent to me by Mr. Oldham from Hertfordshire; also several much larger and darker examples collected in 1907 at Ruckland. As far as I know this species has not been previously recorded for Lincolnshire.—C. S. CARTER, Louth, Lincs.

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BIRDS.

Nuthatch near Louth.—Mr. E. H. Cartwright, North Elkington, reported to me that while shooting in Maltby Wood, near Louth, November 1916, he saw a Nuthatch. This bird is extremely rare in the Louth District.—C. S. CARTER, Louth.

Common Puffin Caught Alive at Cullingworth.—The other night I was asked to go to Cullingworth to see a strange bird which had been caught alive in a field near Denholme on the 7th instant, and although somewhat late, I immediately set off and found the bird to be a Common Puffin. The person in whose possession the bird is at present could hardly believe it was a Common Puffin, never having seen this species before in its winter appearance, and this is not to be wondered at, since its beak and sides of the head are totally different from what obtain in the breeding season. This species, which is essentially pelagic in its habits, is never seen near the land except in the breeding season, unless driven by stress of wind. It is even more rare in this district than its near relation the Little Auk, of which I had a specimen brought to me, perhaps two winters ago, which had been picked up alive near this place, having injured itself by flying against the telegraph wires. At about the same time as the above Puffin was picked up, the caretaker of the Manywells reservoir saw a Gull from his house window try to fly over the embankment of the reservoir, in the teeth of a very strong wind, but was driven back. This was repeated with the same effect. In making its final effort, the wind so disabled it, as to render it incapable of flight; indeed, my informant said one wing of the bird was broken.—E. P. BUTTERFIELD, Wilsden, December 14th, 1917.

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At the recent annual meeting of the Yorkshire Geological Society, Mr. H. E. Wroot was elected Hon. Secretary and Editor. Mr. A. Gilligan, the retiring secretary, was elected on the Council in place of Mr. Cosmo Johns, resigned.

A YEAR'S SCIENTIFIC WORK:

BEING

THE YORKSHIRE NATURALISTS' UNION'S FIFTY-SIXTH ANNUAL REPORT

For 1917.

(Presented at Wakefield, 8th December, 1917.

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The Fifty-Fifth Annual Meeting was held at Selby, on the 2nd December, 1916.

The Naturalist for January, 1917, contained a report of this successful meeting, and the Presidential Address of Mr. W. N. Cheesman, J.P., F.L.S., on 'Economic Mycology: the beneficial and injurious influences of Fungi,' appeared in that journal for June.

Field Meetings.—In accordance with the national call for economy, and having regard to the curtailment of travelling facilities and increase of railway fares, the Executive Committee of the Union decided that the Excursion programme arranged for 1917 should stand postponed until 1918.

The usual sectional meetings have, however, been held in the autumn.

The Excursions for 1918 will be as follows:—

Barnard Castle (Whit Week-end), May 18th to 20th.

Market Weighton, Saturday, June 15th.

Crosshills, Saturday, July 13th.

Settle (August Bank Holiday Week-end), August 3rd to 5th.

Mycological Meeting at Selby.

Membership.—The membership of the Union at the close of 1916, exclusive of Affiliated Societies, was 337, and by reason of resignations and deaths has been further reduced to 330.

The following new members have been added during the year, viz.:—

Col. Edward A. Brotherton, J.P., The Hall, Roundhay, Leeds.

Mr. Colin Clegg, A.M.Inst., C.E., F.G.S., More Hall, Bolsterstone, near Sheffield.

Sir Archibald Geikie, O.M., K.C.B., LL.D., Shepherd's Down, Haslemere, Surrey.

Rev. Reginald H. Harvey, The Rectory, Barwick-in-Elmet, Leeds.

Mr. Edward J. T. Ingle, 18 Strattan Street, Leeds.

Mrs. Charles Ratcliffe, Eagle Hall, Pateley Bridge.

Mr. Fred Rhodes, 113 Park Row, Heaton Road, Bradford.
Mr. J. R. Simpson, Banks, Honley, near Huddersfield.
Dr. H. Douglas Smart, Clifton House, Shelley.
Mr. S. S. Stanley, 8 Kingston Place, Woodhouse Lane, Leeds.
Mr. B. J. Whitaker, M.B.O.U., Hesley Hall, near Bawtry.

The Affiliated Societies now number thirty-three, having a total membership of 2391, the reduction being, of course, due to the difficulties incidental to the times.

Obituary.—The Union has to mourn the loss by death of several of its prominent members, viz: Charles Crossland, Halifax (an ex-President of the Union); George Massee, F.L.S., V.M.H., Seven Oaks (a valued member of the Mycological Committee); T. H. Nelson, M.Sc., J.P., M.B.O.U., Redcar (a valued member of the Vertebrate Zoology Section, and the author of 'The Birds of Yorkshire'); Charles Bradshaw, F.G.S., F.C.S., Sheffield (one of the joint secretaries of the Geological Section); Wm. Foggitt, J.P., F.L.S., Thirsk; Samuel Margerison, Leeds; U. Green, F.G.S., London; Mr. C. T. Trechmann, Ph.D., F.G.S., Castle Eden; and Dr. R. Braithwaite (an ex-President of the Union, and author of 'The British Moss Flora.') 'In Memoriam' notices of these gentlemen have appeared in *The Naturalist*.

Local Treasurers.—For the services rendered by these gentlemen the thanks of the Union are tendered.

General Committee.—The following have been added to the permanent General Committee, viz.:—

W. J. Clarke, F.Z.S., Scarborough.
Walter Greaves, Hebden Bridge.
G. Howard. Rotherham.
J. T. Sewell, J.P., Whitby.

VERTEBRATE ZOOLOGY.

West Riding.—Mr. H. B. Booth writes:—Undoubtedly the exceptionally long and cold winter of 1916-7 had a most disturbing and disastrous effect on the species of birds that usually winter in the West Riding, though to what extent each species was affected is a matter of doubt, and in some cases, of conflicting opinions. But there is general agreement as to how the Thrush family were almost decimated, with the exception of the Blackbird. Curiously, around Ben Rhydding and district there were considerably more hen Blackbirds than cocks, which has been exactly the reverse in other winters). The nesting Song Thrushes have been much scarcer than I have ever known them to be, though this is probably due to the severity of the winter in the south-western counties, and also in the south of Ireland (see C. B. Moffatt, in *The Irish Naturalist*), where such continuous arctic conditions occurred as have

never been known there before. As the winter progressed, and the arctic severity increased, the position of many species became pitiable. The Red Grouse came down from the moors, in large flocks, quite close to our villages and small towns, and could be easily approached. The Lapwings and Golden Plovers that usually pass the winters in our open fields and valleys, disappeared entirely. On February 11th, which might be called the climax, almost all the small birds in the neighbourhood, such as Starlings, Robins, Hedge-Sparrows, Wrens, etc., had congregated at the Ilkley sewage beds ; where also were several Snipe, a score or two of Black-headed Gulls (uncommon visitors in winter) and three Common Gulls. On the same day I put up a flock of at the least sixty frozen-out Mallards from the middle of a dry field. Personally I don't think that several almost semi-domesticated species, such as Blue and Great Tits, House Sparrows, etc., felt the pinch so badly, as they took advantage of the fare provided for them by kindly—but not always prudent—people. As the winter's snows continued until mid-April nesting operations were delayed somewhat, but Rooks were incubating with wreaths of snow around them. The Chiffchaff again nested at Gilstead (S. Longbottom) and another Chiffchaff was reported near Bingley during the nesting season. There is not a single record of the Grasshopper Warbler this season, and Mr. C. A. Cheetham, who had exceptional opportunities for observation at Austwick Moss during the nesting season, failed to note it there—its chief West Riding resort. It has been proved that the Long-tailed Titmouse is again nesting in Upper Wharfedale (*Naturalist*, 1917, p. 367). On June 2nd, I paid a special visit to Threshfield in order to find if the Stonechat was nesting there again (*ante* 1917, p. 33), but failed to find any at all. However, Mr. Greaves informs me that Mr. D. Sutcliffe saw a pair there on July 16th, 1917, with three or four young in the nest—evidently a second brood.

Amongst our summer immigrants it is pleasing to note the reports from many districts that the House Martin has returned this season in its usual abundance, after several years deploring its decrease in numbers. On the other hand several reliable observers, to whom I can also add my testimony, regret the increasing scarcity of the Ring Ouzel on our moorsides.

Other notes worthy of record are :—A Red-breasted Merganser on the river between Steeton and Kildwick, on November 20th, 1916, and a Goosander was also shot about the same time and place (S. Atkinson, per F.H.E.). A Peregrine Falcon shot at Howarth on September 4th, 1917 (J. Bradley, per R.B.). A House Martin's nest with four young on October 14th, 1917, near Silsden (R. Ellam, per F.H.E.). An Arctic Tern sent to me by the Rector of Bolton Abbey,

and picked up recently dead from a shot wound, not far from the Strid, on September 6th, 1917. A Common Scoter and a Black-throated Diver were shot on Thorpe's Reservoir, near Huddersfield (*ante* 1917, p. 124). A flock of Wild Geese settled in a field in Upper Wharfedale, in full daylight, on December 13th, 1916 (*ante* 1917, p. 79) from which the local farmers prophesied a bad winter, and near to the same place seventeen days later, after tempestuous rains and floods, I was surprised to see a pair of Turnstones (*ante* 1917, p. 79).

East Riding.—Mr. E. W. Wade writes :—The exceptionally cold and severe winter had disastrous effects upon bird life. Blackbirds, Thrushes and Redwings died in large numbers and Mistle Thrushes became very scarce. Many remains of dead Peewits were observed upon the Carr lands in April, and the numbers of breeding birds on this ground were seriously diminished, though not on the Wolds. Many of the small birds, *e.g.*, Tits, Skylarks and Wrens were conspicuously scarcer in the Spring.

Of the birds breeding when the snow and frost first returned in April, *e.g.*, Rooks and Thrushes, some sat through the 30 degrees of frost we had in this district, and successfully reared young, but of the Rooks about 50 per cent. lost their eggs and young, whilst those who sat it out reared very small broods. A proportion bred again, having young in the nests in June.

The migrants were generally a week to a fortnight later than in 1916 in appearing, but in this district were in the usual numbers, reared their young successfully, and all disappeared before the end of September, including Swallows and Martins.

The Corncrake still survives here and there, as the rarest of our Summer visitors.

The Woodwren has bred in two localities in this district, where I have no previous record of its occurrence except as a migrant.

A Stone Curlew was shot near Mappleton in November, 1916.

A Spotted Crake, a bird of the year, was killed by a cat in a garden in the heart of the manufacturing district of Hull, on 5th September.

The Stone Curlew appeared on the Wolds on 21st April, and has bred satisfactorily in the protected areas.

The appearance of the Wild Geese has been most unusual this year. A few birds were seen in July, and the bulk had arrived early in September, instead of the usual date, 21st September.

Much damage to small birds has resulted from a no doubt well-meant attempt to start a crusade against the House Sparrow in some localities. Numerous traps have been employed by small boys, with a resulting destruction of Tits,

Robins, and other insectivorous birds, and all kinds of eggs have been taken, including those of Whitethroats and Hedge Accentor, with the idea of diminishing the numbers of the House Sparrow.

Mr. St. Quintin writes that there is little doubt that more than one pair of Quails nested in the East Riding last summer. His bird-keeper, A. Moody, who joined the County Police for the summer and autumn, during his night patrols, heard the bird, which he knows well, on several occasions. A note written on July 18th, stated that 'about a week ago,' he heard Quails in three different places between 12 p.m. and 1 a.m., and he knew of another place when he had news of a bird calling more than once. A male bird would hardly have remained here so late as the beginning of July if he had not a mate incubating, or with young following her.

North Riding.—Mr. W. J. Clarke writes:—In the early months of 1917 the thrush family suffered severely, Redwings, Fieldfares and Song-thrushes dying in great quantities. Many gulls were also starved to death, while the frozen victims included such hardy species as the Mallard and the Kestrel.

The result has been a distinct scarcity, during the remainder of the year, of small resident birds.

Despite the severe weather, a Robin's nest contained five eggs on January 24th; two of the eggs, which were taken out and blown, proved to be perfectly fresh, but the remainder did not hatch.

Migratory birds arrived in much their usual numbers, Landrails and Whitethroats being more numerous than for several years past.

The Hawfinch also has been more in evidence this year than is generally the case.

A pair of Stone Curlews nested in a field of growing corn, miles away from their usual Yorkshire haunts.

A considerable migration of House Martins took place on September 1st, when many hundreds of these birds made their appearance in the evening. All were gone next morning.

York District.—Mr. W. Hewett writes:—Two Cormorants were captured in Buttercrambe Wood, near Stamford Bridge, York, on January 9th, 1917, and were kept alive for a few days. The weather was very cold at the time, with snow. The severe frosts in the spring caused great mortality among Song-thrushes and they were scarce all the summer. The spring migrants were unusually late.

Mammals, Amphibians, Reptiles and Fishes.—Mr. J. F. Musham writes:—At Selby, on March 20th last, I caught a long-tailed field-mouse in the front sitting-room of my residence. Before capture, she had devoured a pound of dates off the table, and hidden the stones in a heap under the sofa.

Mr. Wade writes that the Badger holds its own on the Wolds, in spite of much persecution.

Mr. Roebuck reports a water-shrew dug up in Mr. J. W. Taylor's garden at Horsforth.

Mr. W. Greaves (Hebden Bridge) and Mr. Hewett (York) report that during the severe weather rabbits perished in great numbers in their districts.

Mr. W. J. Clarke (Scarborough) writes:—Several Porbeagle Sharks have been recorded during August and September; a slice from one of these proved very good food. An adult female Lesser Spotted Dog-fish, containing eggs ready for extrusion, was taken at Scarborough, upon a fisherman's line, on 9th February, 1917.

Mr. H. B. Booth reports that a Seal, probably a specimen of *Phoca vitulina*, was killed in the Wharfe, just below Tadcaster, in mid-March, 1917. A large Badger (35 lbs.) was killed near Bolton Abbey.

Mr. F. Rhodes reports that the Palmated Newt appeared to be uncommonly scarce on the moors, the scarcity being probably due to the severe winter.

WILD BIRDS AND EGGS PROTECTION COMMITTEE.

Spurn.—Mr. Johnson Wilkinson writes:—Unfortunately we have not been able to do any watching this Season. The Lighthouse-keeper and his assistant proferred their assistance, but could get no reply from Trinity House.

Mr. E. W. Wade informs me that a stringent prohibition against disturbing the birds had been issued by the General, and the Officers of the R.G.A. at Spurn interested themselves in the enforcement of this. He had kept in touch with Major T. T. Phelps, Intelligence Dept., Humber Garrison, on the subject, and on 30th June, Major Pauley, stationed at Spurn, kindly undertook to see that all eggs were marked with indelible pencil. He reported that he had seen many eggs, but these are scarcer than last year.

Bempton.—Unfortunately the Peregrines have not bred this Season. One old Falcon has been seen several times, as late as June 7th; we can only hope it may find a mate for next Season. There has been only one set of egg-gatherers during the day time; others have gathered during the evening. The Season has been a good one.

North Yorkshire.—Only one young Falcon has been hatched; it got safely away by July 9th.

Hornsea Mere.—This place has been very quiet, there being no bombing; consequently all eggs have hatched well although the numbers of various birds were smaller than usual. There has been the usual number of Great Crested Grebe, one nest contained five eggs; the watcher had never seen more than four in any nest before. No Bearded Tits have been seen.

STONE CURLEWS.—Stone Curlews have turned up well, in fact more than have ever been seen for 10 years, although late in arriving. One nest was destroyed in ploughing a field of turnips. In these districts the weather has been most disastrous for all birds, and migrations most irregular—in fact, the Turtle Dove, usually last to arrive, turned up on April 1st.

BLACK HEADED GULLS.—It was not until the 21st of April that we heard that the eggs of the Black Headed Gull could be taken until June 21st. We at once put ourselves in communication with the largest Gullery in Yorkshire, and through the generosity of the owner, the agent, and watcher, we were able to bring about 1,500 eggs into the market, which were sold at 1d. each in Bradford and York. The price in London at the same time was 4/6 per doz. We were much disappointed at the quantity of eggs as we fully expected between four and five thousand, but the usual numbers of birds were not there. Another Gullery of between four and five hundred birds yielded nearly three hundred eggs, which were taken but not sold.

It is satisfactory to know that we have provided a number of eggs for the poor people ; the small balance in hand after payment of expenses was given to the gatherer.

PROSECUTION.—My attention was called to a note in the *Yorkshire Herald* of a Bittern having been shot. The Northallerton Police took the necessary prosecution and the defendant was fined £1 and costs.

FINANCE.—Our expenses have been very small, but we shall require the balance we have in hand, and more, after the war, for strict protection.

CASH ACCOUNT.

RECEIPTS.	£	s.	d.
Balance brought forward	15	3	1
Mr. W. H. St. Quintin	5	0	0
Mr. L. Gaunt	3	3	0
Mr. Johnson Wilkinson	1	1	0
Dr. Bishop (1916)	1	0	0
Dr. Bishop	1	0	0
Mr. F. H. Edmondson	1	0	0
Hon. G. Milnes Gaskell (Donation)	1	0	0
Mr. A. H. Lumby	0	10	6
Mr. E. W. Wade	0	10	6
Mr. W. H. Parkin	0	10	0
Mr. G. T. Porritt	0	10	0
Mr. Sydney Smith	0	5	0
Rotherham Natural History Society	0	5	0
Bank Interest	0	4	9
	£31	2	10

1918 Jan. 1.

PAYMENTS.

	£	s.	d.
Hornsea Mere	6	0	0
Stone Curlews	2	0	0
North Yorkshire	1	0	0
Cash at Bankers	22	2	10
	£31	2	10

Audited and found correct,
W. E. L. WATTAM, *13th September*, 1917.

ENTOMOLOGICAL SECTION.

LEPIDOPTERA.—Mr. B. Morley writes :—After a long and severe winter and a cold and wet April it soon became evident that an extraordinary insect season was at hand, larvæ began to appear in great numbers on almost every kind of plant and many species of lepidoptera have subsequently appeared in the perfect stage in great numbers.

The three species of White Butterflies have occurred in the greatest abundance throughout the county. *Vanessa urticæ*, *V. atalanta* and *V. io* have been common in many places during August and September. The reappearance of *V. io* in numbers is noteworthy, as for many years this species has been very scarce. *Polyommatus phœas* has also been abundant. *Argynnis aglaia* is reported from Doncaster. *Vanessa antiopa* was captured at Silsden on September 10th, 1917, and another seen at Wilsden during the same month. Many species of moths have been very common ; the antler moth being perhaps the most abundant, and the swarm not by any means confined to the moors, this moth appearing during August in phenomenal numbers in many low-land meadows. In June excessive numbers of *Scardia cloacella*, *Dasycera sulphurella* and *Glyphipteryx fuscoviridella* appeared in the West Riding ; the same remark applies to the appearance of *Penthina sauciana* and *Aphelia osseana* on the moors in July, and to *Gracilaria syringella* in the lowlands in August.

Acherontia atropos is reported from Huddersfield and Doncaster ; *Sphinx convolvuli* from Hebden Bridge, Keighley (three specimens), Barnsley (two specimens), Middlesbrough (seven), and Doncaster (common).

Luperina nickerlii taken at Hebden Bridge in August, has been brought to me, two larvæ of *Acronycta alni* were taken in Edlington Wood in the same month.

Dr. Corbett reports *Stigmonota nitidana* and *Chorcutes scintillulana* common at Doncaster.

Mr. T. Ashton Lofthouse reports from Middlesbrough *Penthina dimidiana* plentiful, and from the same locality

Penthina nigrocostana by Mr. L. S. Brady, the latter species being new to the Yorkshire list, as is also *Eriopsela fractifasciana* at Skelmanthorpe in July.

Antithesia salicella and *Ochsenheimeria birdella* were also taken by me at Skelmanthorpe in July ; *Tinea semifulvella*, and *Incurvaria tenuicornis* in Deffer Wood in June, the latter being the second record for Yorkshire. Mr. Porritt has bred many fine varieties of *Abraxas grossulariata* from Huddersfield larvæ, including a var. *varleyata* with the characteristic black dusting of the *nigrosparsata* variety on the white parts of the wings.

Mr. W. H. St. Quintin writes :— *Vanessa io* occurred at Scampston in small numbers. I saw three specimens (slightly worn) in the garden on September 5th. I had not seen this insect here for quite forty years, previous to which it used to occur here in small numbers. On September 9th, one *V. cardui* in fine condition ; *atalanta* was in exceptional numbers, in very fine condition during the first half of September.

Sphinx convolvuli : I heard of examples being seen or caught at Thornton Dale and Bolton Hall (Leyburn), both in the North Riding. *V. antiopa* : A specimen was seen here for a few minutes on September 3rd. After visiting the various flowers in the herbaceous borders, it left of its own accord (undisturbed) rising high in the air, and flying across the open park.

Coleoptera.—Dr. W. J. Fordham writes :—The work accomplished by the members of this Committee has resulted in a few interesting records being made, but the number of new species added to the county list is not great. The season opened with promise—beetles, especially plant feeders, being in abundance in the late spring and early summer, but their duration seemed short. A list of noteworthy captures together with general remarks on the season will appear in due course in *The Naturalist.*

Hymenoptera, Diptera and Hemiptera Committee.—Mr. J. F. Musham writes :—In the Selby district, the common Bombi and social wasps have been little in evidence. *Bombus terrestris* L., and *B. agrorum* Fab., ♀'s were more frequently seen in the spring than in any other form later.

Three queen nests of *Vespa sylvestris* ? have been taken near Selby, in each case without imagos. During the latter part of September, ♂'s of *Vespa germanica* (locally common) and *V. vulgaris* were numerous. Of more interest, mention may be made of the following :—

Anthropera pilipes, *Megachile centuncularis*, and *Colletes daviesana*, frequent in gardens during July.

I noticed a curious habit of *Odynerus pictus*; on alighting on a bloom of the common blue garden pansy, it immediately slipped round to the rear of the bloom and remained there until disturbed. What the attraction was I could not discover.

Mr. Butterfield, Keighley, writes:—You are lucky to be able to get so many species in your garden; the species too are of a distinctly lowland type, I do not know any one else who has *Anthophera*, *Megachile*, *Colletes* and *Posopis* in this upland district.

For the Keighley district social wasps have not been numerous, it is a number of years since they were so uncommon here.

The social bees have been fairly plentiful. *Bombus jonellus*, considered a rare bumble bee has been locally common, on the other hand, I have not seen a single example of the sub-alpine moor bee, *Bombus lapponicus* of late years. This, the most handsome of our social bees, has gradually diminished in numbers; it would be interesting to get the opinion of other observers, especially in the Whitby area.

Among the solitary bees a special feature of the season has been the large quantities of Nomada. The bright-banded parasitic bees have arrested the attention of the least observant.

The President of the Entomological Section and I saw a large number in Shipley Glen.

Amongst those captured were *Nomada fabriciana* L., *bifida* Thoms., and *lathburiana* Kirb. One day in June, thousands were noted along the roadside between Bolton Abbey and Beamsley, the species were chiefly *N. alterata*, Kirb., and they were entering the burrows of *Andrena rosæ*, var. *trimmerana*.

Worthy of mention is the occurrence of *Halictus atricornis*, Smith, at Shipley Glen.

The Medical Department of the Local Government Board have asked for the assistance of Members of this Committee regarding the movements of *Anophelines* in connection with the possible risks of malaria being acquired in this country. The circular sets forth the nature of the records required, and copies can be obtained by writing to the Medical Department of the Local Government Board.

In the *Entomologist* for August, 1917, Dr. J. W. H. Harrison records the following new and rare Homoptera in the Northern Counties: *Livia juncanum* Latr., thinly distributed throughout the Cleveland district of Yorkshire.

Livia crefeldensis Minll., rare in the Middlesbrough area of North Yorkshire.

Rhinocola aceris L., rare, Gunnergate, Cleveland. New to my Yorkshire list.

Rhinocola ericae, Cant. Plentiful everywhere in Cleveland.

The Entomologist for 1916 also contained papers on Cynipid Galls occurring in Durham, Northumberland and North Yorkshire by the same writer.

ARACHNIDA.—Mr. W. Falconer writes :—Three small consignments have been received from Dr. Corbett, Mr. W. P. Winter and Rev. R. A. Taylor (Burnley) respectively. The first, from Martin Beck Wood, on the county border line, v.c. 63, contained amongst others *Linyphia pusilla* Sund. 1♂, 3♀s, *Theridion impressum* L. Koch ♂ (second Yorkshire station) and *Clubiona grisea* L. Koch, ♀s, all new to the division, and *Tetragnatha extensa* Linn., both sexes, recorded once before for it ; the last, from Scarborough, included 8 or 9 examples of the false-scorpion, *Chernes nodosus* Schr., taken from flies' legs. My own collecting furnishes the following records from the Huddersfield drainage area :—New stations for *Gongylidiellum paganum* Sim. and *Maro minutus* Camb. (the latter still confined to the Slaithwaite district), *Porrhomma thorellii* Herm., numerous ♂s and ♀s from the sewage works at Berry Brow, *Tetragnatha solandrii* Scop. ♀, the only one so far seen in the drainage area, and many mites, including some ten gall-makers.

BOTANICAL SECTION.

FLOWERING PLANTS.—Mr. C. A. Cheetham writes :—The very severe weather during the first three months of the year held up all vegetation ; on Moughton Scar, where *Saxifraga oppositifolia* has been seen in flower by February 1st, there was deep snow up to the second week of April, and until this cleared away, there was no growth. When open weather came, the leeway was quickly made up, and by Whitsuntide all plants seemed quite up to their usual dates for bloom. The effects of the frosts were most noticeable on the gorse and garden evergreens ; reports of the former having suffered severely were to hand from all districts.

There is a general agreement that the year is a good average one for wild fruits, with the exception of the Ash, which is a noticeable failure ; occasionally a tree is seen with 'keys,' but this is often on poor grown or diseased plants, or single branches of larger trees. Can it be that these flowered at a different time to the general body and escaped the untoward circumstances which spoilt the rest ? From Swaledale to Airedale, and in the Huddersfield district, the Mountain Ash carries berries to an abnormal extent and is a glorious sight. Mr. J. F. Robinson finds that in the East Riding fruits are on the whole below the normal average, citing Ash, Bramble, Sloe, Guelder Rose and Woody Nightshade, as all poor.

Reports of orchards vary somewhat, but a general agreement is that this has been a pear year.

No records of new plants are to hand, but confirmations of old observations as *Trientalis Europæa*, Ilkley Moor, near Helwick, 1677, *vide* Lees' 'Flora,' still there (J. Beanland); *Carex axillaris* and *C. pseudo-cyperus*, near Hull, doing well this year (J. F. Robinson); new localities for *Rumex alpinus*, are Guyscliff, Nidderdale and Cookridge, Airedale (Sanderson and Cheetham).

Mr. W. B. Haley sends a note on the Dewsbury aliens, which is added to the report of the botanical sectional meeting. At the meeting of this Section held at Leeds, in October, Dr. F. Arnold Lees showed fronds of Holly fern collected near Settle this year; it is good to know that this plant still grows in our area. He also showed the Galium mentioned in his note on page 328 of the October *Naturalist*. Mr. J. Beanland showed a gathering of this plant from Hubberholme, which carries it much higher up the river.

Botanical Survey Committee.—Mr. W. H. Burrell writes:—At Huddersfield Dr. Woodhead has been engaged in tracking glacial deposits, with a view to establishing a foundation for the origin of the local flora. A report of his work was published in *The Naturalist* for July, pp. 219-232, and further instalment showing the influence of these transported subsoils on the vegetation of the Colne and tributary valleys will be looked for. During the year the Doncaster Scientific Society has been working at the Natural History of Martin Beck, and a botanical survey of the wood is being carried out. The progress of the work was sketched by Dr. Corbett at the annual meeting of the Botanical Section, and details will be published in due course.

The study of the Ling covered areas of the limestone at Moughton is being continued. A series of microscopic slides showing seeds and organic debris from the lowest layers of peat was on exhibition at Leeds on October 6th.

Bryology.—Mr. W. Ingham, B.A., writes:—During the past year has been published the 'Synopsis of the European Sphagna,' by J. A. Wheldon, based upon Warnstorf's Sphagnologia Universalis. In this work are many records by myself, of which a few are appended:—

Sphagnum fimbriatum var. *validus* (Wheeldale), var. *laxifolium* (Arncliffe Wood); *S. Girgensohnii* v. *robustum* (Black Hambleton) and var. *microcephalum* (Wheeldale); *S. Russowii* var *Girgensohnioides* (Reeth); *S. plumolosum* var. *late-virens* (Buttercrambe Woods); *S. compactum* var. *isophylla* (Sandburn Wood); *S. squarrosum* var. *Spectabile* (Buttercrambe Woods); *S. parvifolium* vars. *Warnstorfii* and *Inghami* (Fen Bog); *S.*

pulchrum (Ravenscar) ; *S. auriculatum* var. *laxifolium* (Fen Bog).

Mr. C. A. Cheetham found *Weisia tennis* and *Plagiothecium depressum* at Wentbridge.

Mycology.—Mr. A. E. Peck writes :—No meetings have been held, but Mr. Harold Wager has been collecting Fungi in Litton Dale, and has been investigating spore colouration in the Fungi. He has also made some experiments on the colouring matters of *Leptonia incana*. Yorkshire Mycology suffers severely by the decease of Charles Crossland (December 9th, 1916), see *The Naturalist*, January, 1917, and 'Transactions of the British Mycological Society for season 1916' (Vol. V., Part 3.) and of George Edward Massee (Feb. 16th, 1917), see *The Naturalist*, April, 1917, and 'Transactions of the British Mycological Society for Season, 1916' (Vol. V., Part 3).

GEOLOGICAL SECTION.

Geological Section.—Mr. John Holmes writes :—Although there has been no opportunity for combined effort, much work has been accomplished by individual members of the Section during the year. Dr. Woodhead has made a valuable contribution to the glacial geology of Calderdale by his observations on the excavations near Huddersfield. Mr. Gilligan has described some interesting minerals found in the Millstone Grit. The revival of the glass industry in South Yorkshire has stimulated the study of sands, within the county and elsewhere. The materials used for refractories in the iron and steel industry have also received attention.

Jurassic Flora Committee.—Mr. J. J. Burton writes :—All operations on a systematic scale have been suspended for the present. Owing to the war, the difficulty of travel, the many claims upon the time of members of the Committee and the quantity of material not fully examined, it is not anticipated that much more can be done for some time.

Coast Erosion Committee.—Mr. J. W. Stather writes :—The sea is still eroding the Yorkshire coast, and falls of cliff have occurred, but for obvious reasons no accurate information can be given on these points just now.

Glacial Committee.—Mr. Thomas Sheppard, M.Sc., reports that Mr. T. Crowder of Bardney, Lincs, informs him that during some excavations in the main street at Bardney a little while ago, an enormous block of stone was discovered at about a depth of 2 feet from the surface. It measured 10 feet long, by 6 feet wide, by 2 feet deep. It was a rough

unhewn block, and had to be broken up in order to remove it. A further boulder, somewhat oval in shape, about 3 feet long, and 1½ feet across, was found during excavations at Bardney Abbey. Chippings from both these boulders have been sent to Mr. Sheppard, who states they are unquestionably of Spilsby sandstone.

Soppitt Memorial Library.—The following additions have been made during the year :—The late Mr. Chas. Crossland's interleaved and annotated copy of the Fungus Flora of Yorkshire, kept up to date until his death, also letters and obituary notices of H. T. Soppitt and letters relating to the library, presented by Mrs. Crossland. A Guide to the Literature of British Diptera, by Mr. Percy H. Grimshaw. Transactions of the Entomological Society of London, 1916, Part 5. Transactions of the North Staffordshire Field Club and Report, Vol. LI., 1917. Proceedings of the Birmingham Natural History and Philosophical Society, Vol. XIV., Part 1, and Annual Report for 1915. Tuft's College Studies, Vol. IV., Nos. 3 and 4. Synopsis of the section Apus of the genus Polyporus, C. G. Lloyd. Archibos do Jardim Botanico do Rio de Janeiro, 1915. Archivos Barcinonensis, Zoological Series, 1, 2, 3, 5, 6 and 7 ; and Series Botanica II., 1917.

British Association.—Mr. T. Sheppard, M.Sc., writes :—Your representative attended the Conference of Delegates of the Corresponding Societies held in the Linnean Society's rooms on July 6th and 7th, under the Presidency of Mr. John Hopkinson, a Yorkshireman, and the report of the meeting appeared in *The Naturalist* for August. He also had the honour of reading a paper on the subject of 'Weights and Measures,' which will be printed *in extenso* in the next report of the British Association.

The Naturalist.—This journal has maintained its high standard of excellence during the year. The thanks of the Union are given to Dr. Woodhead and Mr. T. Sheppard, M.Sc., for supplying the blocks in illustration of their various contributions entirely free of cost.

The Presidency for 1918 has been offered to and accepted by Prof. W. Garstang, M.A., Sc.D., F.Z.S., of Leeds.

The Union wishes to record its indebtedness to its retiring President, Sir Archibald Geikie, O.M., K.C.B., LL.D.

Financial Statement.—The following is the Hon. Treasurer's (Mr. Edwin Hawkesworth) statement of Receipts and Payments :—

STATEMENT OF INCOME AND EXPENDITURE,

12 months to November 19, 1917.

INCOME.

	£ s. d.	£ s. d.
Members' Annual Subscriptions, arrears	4 0 0	
,, 1917	64 10 0	
,, 1918	1 14 0	
		70 4 0
Levies from Associated Societies, arrears	0 11 0	
,, 1917	8 6 0	
		8 17 0
Bank Interest		4 11 4
	£ s. d.	
'NATURALIST':—		
Subscriptions, arrears	3 6 0	
,, 1917	80 14 0	
,, 1918	2 2 0	
		86 2 0
		£169 14 4

EXPENDITURE.

	£ s. d.	£ s. d.
Expenses of Meetings		2 10 10
Printing and Stationery (General A/c)		8 6 6
Postages, etc. (Hon. Secretaries' A/c)		4 17 4
Clerkage, ,, ,,		10 0 0
Stationery, etc. (Hon. Treasurer's A/c)		0 14 9
Postages etc., ,,		1 2 8
Wreaths		2 6 0
Bank Commission		0 2 9
Cost of Publications:—		
Annual Report, 1916 .. £7 17 0		
,, ,, 1917 (est.) 9 0 0		
	16 17 0	
Less—Provision in A/cs for 1916	6 15 0	
		10 2 0
'NATURALIST':—		
Members' Copies .. £101 11 3		
Exchanges 3 15 0		
Sundries 0 13 0		
Editor's Postages, etc. 7 2 2		
Extra pages 5 10 4		
Binding 0 10 0		
Discount deducted and not allowed 3 2 6		
		122 4 3
Balance, being excess of Income over Expenditure		7 7 3
		£169 14 4

BALANCE SHEET, November 19, 1917.

LIABILITIES.

	£ s. d.
Amounts due from Union—	
'Naturalist'	44 10 9
Annual Report, 1917..	9 0 0
Subscriptions received in advance	3 16 0
Life Members' Account	74 19 0
'Hey' Legacy Account	20 0 0
Balance, being excess of Assets over Liabilities, Nov. 19th, 1917 ..	81 7 11
	£233 13 8

ASSETS.

	£ s. d.	£ s. d.
Cash at Bank	137 4 9	
Cash in Hon. Secretary's hands..	2 3 2	
Cash in Hon. Treasurer's hands..	0 15 9	
		140 3 8
War Savings Certificates for £100 (February 12th, 1917), cost ..		77 10 0
	£ s. d.	
Subscriptions in Arrears..	20 2 0	
Written off as unrealisable	4 2 0	
		16 0 0
		£233 13 8

E. HAWKESWORTH,
Hon. Treasurer.

1918 Jan. 1.

NEWS FROM THE MAGAZINES.

In *The Irish Naturalist* Vol. 24, No. 10, Mr. C. B. Moffat writes on 'Losses to a Local Flora,' and Mr. J. P. Burkitt has a 'Note on the Long-eared Owl.'

The December number of *British Birds* contains particulars of the recovery of marked birds, and a record of Leach's and Storm Petrels in North Lancashire and Westmorland.

Nature for November 22nd contains an abstract of Prof. W. G. Fearnside's Howard Lectures delivered before the Royal Society of Arts on 'The Shortage of the Supply of Non-Phosphoric Iron Ore.'

In *The Entomologist*, No. 653, Mr. W. G. Sheldon writes on '*Peronea cristana*: Its life-history, Habits of the Imago, Distribution of the various named forms, and some speculations on the present trend of its variation'; Mr. Claude Morley 'On the Proctotrypid Genus *Gonatopus* Ljunch'; and *Daphnis nerii* is recorded for Derbyshire.

Vol. III., No. 3 of *The Vasculum* contains a paper on 'The Order Protura,' by Mr. R. S. Bagnall; 'The Erosion of Rocks,' by Dr. J. A. Smythe, and 'Notes on the Winter of 1916-7 in the Alston District,' by Mr. George Bolam. Dr. J. W. H. Harrison writes on 'The Genera Orchis and Gymnadenia in Durham,' and there are the usual shorter notes.

A recent number of *British Birds* contains 'Evidence for the Breeding of the Green Sandpiper in Westmorland in 1917.' To this the Editor adds the following note:—'Had one of the young birds been taken and its skin preserved in some public museum lasting and incontrovertible proof would have been afforded, and it seems to us a great pity that the opportunity of obtaining such a proof was missed.'

In *The Entomologist's Magazine* No. 641, Mr. R. S. Bagnall describes '*Aylax rogenhoferi* (Wachtl), A Cynipid (Hymenoptera) new to the British Fauna,' from Durham. In the same number Mr. W. J. Fordham records the black form of '*Silpha subrotundata* Steph. in the Isle of Man'; and Mr. R. Wilding notes '*Arena octavii* Fauv. on the Lancashire Coast.' Mr. Fordham also records '*Aylax taraxaci* Ashm. in Derbyshire,' and Mr. E. G. Bayford has a note on 'Cannibalism in phytophagous larvæ when in confinement.'

Wild Life for October contains illustrated articles on 'The Nesting of the Landrail, with some Notes on the species' Distribution,' by Ralph Chislett; 'Some Notes on the Badger,' by Ion C. B. Jamieson; 'The Woodlark in North Devon,' by Owen Wynne; 'Economic Ornithology,' by William Berry, as well as interesting records under the head of Correspondence. There is also an obituary notice of the late 2nd Lieut. E. L. Wood, who was a native of Grimsby.

The New Phytologist, Vol. XVI., Nos. 8 and 9, contains the following items:—Observations on the Influence of Aeration of the Nutrient Solution in Water Culture Experiments, with some remarks on the Water Culture Method, by W. Stiles and I. Jörgensen; The Origin and Development of the Compositæ, by J. Small; The Endotrophic Mycorhiza of Ericaceæ, by J. Dufrénoy; Note on *Targionia hypophylla*, by S. R Kashyap; 'Fossil Plants' (Review), by D. H. S.; On Some Criticisms of the Osazone Method of Detecting Sugars in Plant Tissues, by S. Mangham

In *Man* for November, Mr. J. Reid Moir figures and describes a piece of Yew from the Cromer forest bed. It is very bluntly obtuse at one end, and the opposite end is flat, which, of course, 'appears to have been produced by sawing.' The object is described as 'a piece of humanly shaped wood,' but the evidence of such a definite statement seems about as meagre as is so much of the evidence of very early man, which is constantly coming forward in East Anglia. Plenty of pieces of wood similar to that figured may be obtained from almost any peat bed, which are known to have been contemporary with *homo*, but few experienced naturalists would dare to suggest that they were 'humanly shaped.'

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Jan. 1st, 1918.

FEB. 1918. No. 733
(No. 508 of current series.

THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

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THE MUSEUMS, HULL;
AND
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WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
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RILEY FORTUNE, F.Z.S.

Smithsonian Inst. Library
JUN 24 1920
National Museum

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Internat. Journ. Micros. and Nat. Sci. 1891-97.
Journ. Micrology and Nat. Hist. Mirror. 1914–
Young and Bird. Geol. of Yorks. Coast. 2nd ed. 1828.
Derby Arch. and Nat. Hist. Soc. Parts 20, 21.
Journal Marine Biological Assoc. Vols. I.-IV.
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Trans. Geol. Soc., London, 4to. 2nd series, Vols. IV.-VII. (1836-56).
Geological Magazine, 1890-1-2-4.
Mackie's Geol. and Nat. Hist. Repository. Vols. II., III.
Proc. Liverpool Geol. Association. Parts 1, 3, 7, 16.
Reliquary (Jewitt's 8vo. Series). Vols. XXII. and XXIV.
Irish Naturalist. Vols. 1912-16.
Scottish Naturalist. 1881-95.
Annals of Scottish Nat. Hist. 1905-1916.
Walford's Antiquarian Mag. and Bibliographer for July-Dec., 1885.

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NOTES AND COMMENTS.

LOUVAIN

But a little while ago, the civilized world was horrified at the destruction of the wonderful library at Louvain. It was felt that such disrespect for a centre of learning could hardly exist, even in the breast of the Hun. But it did—and a world-famed library was pillaged and burnt, treasures gathered together during the lives of many eminent scholars, for the enlightenment of humanity, being lost for ever. Few expressed themselves more frankly than the British, and a movement was soon afoot in this country to endeavour to repair this damage, in some small way, by collecting rare books and MSS., to be sent to Louvain when it is safe to do so. And we thanked Heaven we were British, and joined the world in cursing the Hun.

AND LONDON.

And then, but a few days ago, we found, in our greatest city, in the centre of English wealth and learning, an attempt, nay, more than an attempt, to take over the British Museum in Bloomsbury, in order to accommodate the rabbit-like increasing quantities of males and females employed by the Air Board; and also to take over the Natural History Museum, at South Kensington, for the accommodation of clerks employed in connection with insurance. These steps, we understand, were taken by the Office of Works, as represented by Sir Alfred Mond — presumably an Englishman, son of Sir Ludwig Mond — also presumably an Englishman, though had we not known this, we might have assumed that such an action had emanated from the brain of a Hun.

THE BRITISH MUSEUM.

The treasures in the British Museum are vested in the charge of Trustees, who are directly responsible to Parliament. As Trustees, they have absolute say and power in matters of this sort. Yet they were not even consulted, and without attempting to ask their opinion, steps were taken to close these national institutions, remove their contents, and transform the buildings into offices. This by an Englishman, in England, in the twentieth century!

IGNORANCE.

Such action surely reflects small credit upon the powers that be as to their knowledge of the museum and its work. In the first place, the museum—and particularly the Natural History Section—has been of incalculable service in connexion with the war in many ways. This aspect of the museum's work, at least, should appeal to those supposed to be interested

in the furtherance of the war ; yet it would be stopped, if the buildings were closed and the collections were removed, to say nothing of the loss to science, literature and art generally (and we may include commerce), though this may not be expected to appeal to the said powers. But the collections in the British Museum cannot be hurriedly packed and carted off by pantechnicon vanmen, and in any case, if every possible care were taken, damage to *objects which cannot possibly be replaced* was inevitable.

BOMBS.

There is a further aspect of the question ; if our principal museum buildings are being used for war work, we can hardly expect them to be respected in case of air raids—which are quite possible ; and experience has shown that the raiders are able to select their targets—and hit them !

PROTESTS.

However, as soon as the object of the Air Board was known, there was such a spontaneous storm of indignation set up—the Press, for once, was unanimous in condemning the scheme—and scientific societies, large and small, throughout the country, were hurriedly called together, and telegrams of protest were forwarded in great numbers. Yorkshire societies were as active in their way as any. *Punch* especially had an effective appeal in its cartoon, ' Another Air Raid.' *The Times* and other papers published letters and articles.

LORD SUDELEY.

When Parliament assembled, Lord Sudeley called attention to the proposed appropriation of the British Museum to the purposes of the Air Ministry, and of its branch, the Natural History Museum at South Kensington, for other public offices. He was confident, he said, that the decision to appropriate the building was arrived at by the Government before they had been able to obtain full information. All the learned societies throughout the country, and all the great authorities, had protested against the proposal to appropriate so great a national trust. The idea was an absurd one, especially in view of the fact that other buildings were available for the purpose. The accommodation of the Hotel Cecil, he understood, had not been fully utilised. The Port of London Authority's buildings and the Bethlem Hospital buildings could also be utilised for the purposes of the Air Ministry. The Natural History Museum had done an immense amount of work for War Services.

LORD CURZON.

In reply, Lord Curzon said :—' As regards the British Museum, it has been found possible so materially to reduce

the demands for the accommodation of the Air Ministry that it is no longer necessary to appropriate a building of that size. That, I may say in passing, was the sole reason for which the proposal had been put forward to consider that place. Thus it will be possible to locate the Air Ministry under my noble friend on my left (Lord Rothermere) elsewhere. Meanwhile, however, two of the floors of the new wing of the British Museum have for some time been occupied by a Public Office or for other War purposes. The progressive removal of treasures to places of greater safety, which is being steadily pursued—as I am sure it will be with the concurrence of the House—will enable a still larger space in the Museum to be employed for this purpose, and this space will, *with the consent of the trustees and in consultation with the Museum authorities*, be utilised for the accommodation for other non-combatant departments similar to those which are already housed in the Museum."

THE NATURAL HISTORY MUSEUM.

'The second part of my noble friend's question relates to the Natural History Museum, a branch of the British Museum at South Kensington. As regards that place, it has been found on detailed examination that any attempt to convert the galleries to Government uses would entail the closing of the building to the public, an extensive rearrangement of the contents and possible damage in the course of removal, the consumption of an enormous amount of labour and material, and very considerable delay. In these circumstances it has been decided that there is no necessity sufficiently urgent to warrant the use of the Natural History Museum for Government purposes.' Thus, apparently, the reason for the change in the attitude of the Office of Works was *not* on account of the opposition of the public and press, but merely that it was possible to reduce the demands of the Air Ministry (one report says by reducing the staff by 50 per cent. !), and therefore, that a large building like the British Museum would not be required; also, that the time of removal, with possible damage to the natural history specimens, caused the South Kensington Museum to be unsuitable. All we can say is, 'We *don't* think!' As one of the London papers puts it, 'All is well that ends well, but the incident is not likely to be forgotten, and the complete defeat of this mad project by the emphatic condemnation of public opinion should be a salutary lesson to the new bureaucracy wherever the lesson may be required.'

THE TRUSTEES.

One aspect of the case, now that it is all over, would be amusing, if it were not so pathetic. The Trustees of the British Museum, who morally and legally have absolute control of

the collections, and to whom the donors look for the proper care of the various specimens they have given to the nation, have written thanking the press for the support given in this crisis. There is no doubt that this support was most necessary, but we trust that in the future the Trustees of the British Museum will decide momentous matters of this kind without leaving it to public opinion. If the Trustees *are* the Trustees, and if they *have* the power which was given them by an Act of Parliament passed in the reign of George II.—an Act which has never been repealed—they should have had the power to have prevented Sir Alfred Mond or anybody else from interfering with the control of the Buildings and their contents.

LETTERS IN THE PRESS.

We should much like to refer at length to the correspondence which has appeared, but will be content with quoting from two: the first, on behalf of the Museums Association, signed by the President (Mr. E. Rimbault Dibdin), and the Hon. Secretary (Mr. E. E. Lowe); and the other from Sir Henry H. Howorth. Both appeared in *The Times*:—

THE MUSEUMS ASSOCIATION.

'The Museums Association desires to support in the most unequivocal manner, the weighty protests raised in your pages by Sir John Sandys, Sir Arthur Evans, Sir H. H. Howorth, Mr. R. C. Witt, Mr. Kennedy Jones, M.P., Mr. C. J. Holmes and Mr. H. E. Malden. My Council has, however, reason to believe that the Government proposes to take a further step no less disastrous to the interests of learning. It intends, we hear, to turn out collections and workers from the greater part of the galleries of the Natural History Museum, so that it may house a couple of departments, which it is evicting elsewhere. Had the proposers of this step any conception of the damage it must inflict on the present and future welfare of the nation itself, no less than on the priceless and irreplaceable collections entrusted to its charge for present and future generations, then no words of reprobation could be too strong for them. We who, as professional museum officials, are familiar with the vast extent of these collections, with the scientific research of which they are the foundation, and with the labour involved in the mere task of preserving them in orderly and good condition — are appalled at the certain confusion, at the inevitable and irremediable damage, and at the years of unnecessary labour such a step will involve. Few, even of the educated public, understand the magnitude of the interests affected, and we therefore consider it our duty to raise the most solemn protest and warning before the step is irrevocably taken.'

SIR HENRY H. HOWORTH.

In his letter Sir Henry writes:—'It was an act of unparalleled impertinence and absurdity when the Chief Officer of Works, who did not come himself, sent his myrmidons to inspect and to claim to initiate the taking over of the place, the movement of its contents, and the alteration of the building without the permission of the Trustees, which has never been given. I ought to know, for I am one of them. It would be, in fact, a gross breach of trust (not the first that some of them have committed) if they were to consent. Their Act of Parliament behind which they stand absolutely forbids the removal of any of the contents of the Museum, and if they consent it will be at their peril. I am speaking by the book. It is to be hoped that at the earliest moment after Parliament meets the whole question will be raised in the House of Commons and a vote taken. If it were to be followed by some resignations the skies would not weep.'

THE SCIENCE MUSEUM.

As a contrast, we have the news that the Science Museum at South Kensington, which was closed some time ago, has again been opened to the public. It will be remembered that the then Prime Minister, for some reason best known to himself, closed, or partially closed, some of the London Museums. It was also hinted that this action might be followed in the provinces. The suggestion was so much respected that we believe not a single provincial museum has closed its doors, though most of them are working with a minimum staff. The reopening of the Science Museum seems to be an indication that the provinces were right, and that our London leaders were wrong.

SORBY SCIENTIFIC SOCIETY.

From the first of January, two old established societies—the Sheffield Naturalists' Club (founded 1870) and the Sheffield Microscopical Society (founded 1877)—cease to be as separate societies. The members have joined forces, and, under the title of 'The Sorby Scientific Society,' the work of the two societies will be carried out, but on broader lines, which modern developments have made desirable. We should like to congratulate our friends on adopting the name of Sheffield's greatest scientist for the amalgamated society, and we believe the members of the new Society will aspire to the standard of excellence which the name of Sorby warrants.

NORTHUMBERLAND FISHES.

From Mr. George Bolam we have received the first part of a memoir on the 'Fishes of Northumberland and the Eastern Borders,' reprinted from Vol. XXIII. of the 'History of the

Berwickshire Naturalists' Club.' The present instalment deals with over 100 species, principally marine, and in addition to giving full details of their occurrence and distribution, he also provides an interesting account of previous papers on the same subject. The reprint occupies 45 pages, and is a distinct contribution to the Zoology of the district with which Mr. Bolam is so familiar.

LANCASHIRE AND CHESHIRE ENTOMOLOGISTS.

At a recent meeting of the Lancashire and Cheshire Entomological Society, Mr. W. A. Tyerman showed a collection of moths which were taken in the neighbourhood of warehouses in Liverpool. Four species of the genus *Ephestia* were represented, viz., *E. elutella*, *E. passulella*, *E. ficella* and *E. kühniella*, also *Plodia interpunctella*, *Melissoblaptes cephalonica* and *Sitotroga cerealella*, all having been more abundant than usual this year. The Rev. F. M. B. Carr had the results of his collecting in Delamere Forest and district during the past summer; the exhibit included a specimen of *Plusia moneta* bred from a larva found at Tarporley, this being the second record for Cheshire, the other by Mr. R. Tait being from Ashton-on-Mersey. Mr. Carr also showed *Plusia iota*, *P. pulchrina* and *P. festucæ*, a nice series of each from his garden at Alvanley. Dr. John Cotton exhibited a specimen of *Sphinx convolvuli* taken in a back yard at St. Helens in September.

THE SOUTH EASTERN NATURALIST.

The Editor of the South Eastern Naturalist, Mr. E. A. Martin, Assistant Commander, Metropolitan Special Constabulary, is certainly to be congratulated on being able to produce a volume of nearly 200 pages, containing full reports of the twenty-second Annual Congress held in London in June last, as well as the various addresses, etc., then delivered, and on issuing it before the close of the same year. The Conference was referred to in *The Naturalist* at the time, but the present publication is a permanent record of the valuable reports and papers then submitted.

THE LIBRARY.

Notwithstanding the difficulties of publication there seems to have been no curtailment of the reports, though we think this might profitably have been done in the way of the list of gifts to the Library. For example, the publications of the Brighton and Sussex Natural History Society, etc., could have been perfectly well described in half-a-dozen lines, instead of reprinting the exact title of each individual report extending between 1855 to date. This occupies four pages, three or four lines being usually given in repeating the titles of the reports, the only difference being in the date, etc. The same with the Essex Field Club, to reprint the title, sub-title, numbers

or parts, dates, editor's name and titles, and the fact that it is illustrated, occupies 41 lines, whereas practically all the information could have been given in four. This, however, is a detail.

JAWS OF ANCIENT MEN.

Dr. W. Martin's presidential address on 'Science and Industries' is given in extenso, Mr. William Huntly Martin gives his first experience in diving; Mr. E. A. Martin writes on 'Skulls and Jaws of Ancient Man and His Implements.' In this the writer has very closely followed the views expressed in Dr. Keith's 'Antiquity of Man,' even falling into the same error as Dr. Keith with regard to the Ipswich Skeleton, which Mr. Martin, faithfully following Dr. Keith, says 'must be pre-Chellean,' being evidently unaware than since Dr. Keith's book was printed the original discoverer of the skeleton, Mr. J. Reid Moir, has admitted that it is of comparatively recent date. This fact has been recorded in *Nature* and in *The Naturalist*, and other publications, which have apparently escaped Mr. Martin's notice. Other papers are:—'Are Acquired Characters Inherited?' by Prof. E. W. MacBride; 'London Tokens,' by W. Dale; 'Notable Trees and Old Gardens of London,' by B. D. Jackson; 'Abnormal Atmospheres and the Means of Defence against them,' by J. S. Haldane; 'The Associations of the Chelsea Physic Garden with the History of Botany,' by Prof. G. S. Boulger.

HANDBOOK OF REGIONAL GEOLOGY.

Perhaps one of the most remarkable books dealing with an interesting aspect of British Geology, has recently appeared in English, but printed and published in Germany during the third year of the Great War. The book is probably one of a series which was started before war was declared, but it has been printed while the war has been in progress. The volume contains no fewer than 354 pages, and hails from Heidelberg. It is remarkably well illustrated by maps, sections and diagrams, and forms part 20 (Band 3, 1) of a 'Handbuch der regionalen Geologie.' The publication is issued under the general editorship of Dr. Evans, and is written by Messrs. P. G. H. Boswell, G. A. J. Cole, A. M. Davies, C. Davison, J. W. Evans, J. W. Gregory, A. Harker, O. T. Jones, P. F. Kendall, L. Richardson, W. W. Watts, and H. J. O. White. We believe there are very few copies in this country, but one is to be seen in the Library of the Geological Society of London.

FAMOUS YORKSHIRE BOTANISTS.

At a recent meeting of the Yorkshire Philosophical Society, Mr. H. J. Wilkinson, the hon. curator of the botanical collection,

who has just completed the catalogue of the Society's herbarium, gave an interesting account of some of the principal contributors to the herbarium. Chief among these was the Rev. James Dalton, rector of Croft, who was born in York, and who became one of the leading botanists of the kingdom. He presented his herbarium and collection of coleopterous insects to the Society. Miss Mary Ann Dalton, who was her father's coadjutor, illustrated many of her father's botanical works. Sir James Dalton Hooker, the famous scientist, and godson of the Rev. James Dalton, when ninety years of age, wrote to Mr. Wilkinson stating that Mr. Dalton's microscope was given to him by his godfather, and he used it during the whole of his work with the Antarctic Expedition in 1833, and it was now in the Kew Museum. In the course of some further remarks on certain specimens from the herbarium, the lecturer stated that he was convinced that if the land around York were to go out of cultivation there would again be a magnificent forest of oaks.

LONDON NATURALISTS.

The Transactions of the London Natural History Society have recently appeared (112 pages, 3s.), and besides the reports of sections, extracts from minutes, etc., and the Annual Report of the Birds of Epping Forest, there are the following:—'Presidential Address' (by Dr. E. A. Cockayne); 'The London Gulls,' by F. J. Stubbs; 'Some Points of Interest in the Geometridæ,' by L. B. Prout; 'The Apterous Condition in Lepidoptera,' by T. A. Chapman; and 'Some Aspects of Birds' Life in Europe,' by J. A. Simes. In view of the present conditions the publication is a laudable one, the only objection we have being that the advertisements are paged with the rest of the matter, and as some are printed on the back of the last page of the index they cannot very well be torn out.

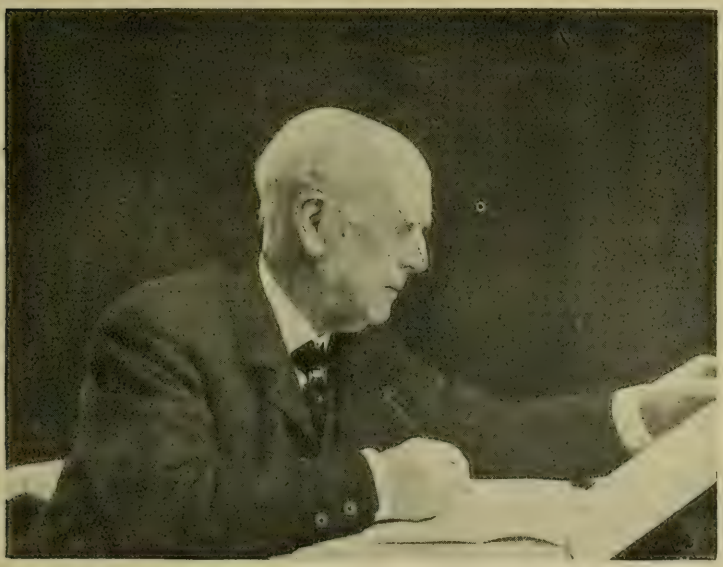
MANCHESTER MICROSCOPISTS.

The Annual Report and Transactions of the Manchester Microscopical Society for 1916 (125 pages, 1s. 6d.), was issued on January 3rd. It is a particularly valuable number, and besides the usual reports and rambles, etc., contains the following:—President's Address, 'Seeds and Seedlings of Orchids'; 'Notes on Two Hepatics,' by H. G. Willis; 'Notes on the Reproduction of Hydra,' by A. E. Openshaw; 'Notes on Residues obtained from the Treatment of Substances with Acids,' by R. Pettigrew; 'Plant Hairs,' by C. H. Brierley; 'Some Notes on Alcohol,' by H. Garnett; 'Pathogenic Protozoa,' by G. Talbot; and '*Plumatella repens*,' by W. Harvey. Of especial interest is Mr. Mark Sykes' report on the British Association meeting at Newcastle, in which he deals

with the discussion which took place relating to extension work of local Scientific Societies. It is of interest to recall that the Manchester Microscopical Society was the leading Society with its scheme of extension lectures, Mr. Mark Sykes being one of the founders of that section of the Society's work.

SIR ARCHIBALD GEIKIE.

We are honoured in being permitted to present to our readers a charming portrait of the Past President of the Yorkshire Naturalists' Union, Sir Archibald Geikie, O.M.,



K.C.B., F.R.S., etc. The portrait has not previously been published, and in Sir Archibald's opinion, is the best he has ever had taken. It was secured by an amateur while Sir Archibald was working in his study.

HETERANGIUMS OF THE BRITISH COAL MEASURES.

In the *Linnean Society's Journal—Botany*, for November, Dr. D. H. Scott has a detail paper on the above subject, in which he describes *Heterangium shorense*, a new species from Shore, Lancashire, found by Messrs. J. and J. Lomax; *H. tiliæoides*, from the Halifax hard beds; *H. Lomaxii*, and varieties from Lancashire; and *H. minimum*, a new species from Dulesgate, found by Mr. James Lomax. The paper is

accompanied by many excellent illustrations of sections of the plant described.

HERTFORDSHIRE NATURALISTS.

The *Transactions of the Hertfordshire Natural History Society and Field Club*, two parts of which were published during 1917, have long been looked upon as model publications for a local Naturalists' Society. This is doubtless largely due to the care exercised by the Editor, Mr. John Hopkinson. The two parts before us contain valuable contributions on almost every branch of Natural History, and all the articles have a distinct bearing upon the county. Mr. Hopkinson, among other contributions, has an interesting note on 'Rotifers

Test of Nebala collaris (inverted), inhabited by a rotifer.

living in Rhizopods' Tests,' from which paper we are permitted to reproduce one of the illustrations.

LIVERPOOL BIOLOGISTS.

The Proceedings and Transactions of the Liverpool Biological Society, Vol. XXXI., for the Session 1916-1917, is considerably reduced in size (114 pages), doubtless as a result of the war, though we notice the price has not changed. Among the contents, besides the usual summary of Proceedings, etc., are Presidential Address, The 'Economy of the Movement,' by Prof. J. S. Macdonald; 'Thirtieth Annual Report of the Liverpool Marine Biological Committee, and their Biological Station at Port Erin (with an Address upon "Sir Wyville Thomson and the 'Challenger' Expedition)" by Prof. W. A. Herdman; 'Report on the Investigations carried on during 1916, in connection with the Lancashire Sea-Fisheries Laboratory at the University of Liverpool and the Sea Fish Hatchery at Piel, near Barrow,' by Prof. W. A. Herdman, Andrew Scott and James Johnstone.

IMPLEMENTS OF THE BRONZE AGE IN THE WHITBY MUSEUM.

T. SHEPPARD M.Sc., F.G.S.

THROUGH the kindness of Mr. T. Woodhouse Parkinson, the Curator of the Whitby Museum, I have had an opportunity of examining the small but interesting collection of Bronze-Age weapons under his charge. There are twelve in all, though two are forgeries, two are evidently of Irish origin, and some are imperfect. Respecting most of them there is no information as to locality, though they were probably chiefly found in the Whitby neighbourhood.

Fig. 1 is a small bronze spear head of plain type, one portion of the socket of which is torn away. Its total length is $4\frac{1}{4}''$; it is 1" broad, and when complete would be 1" across at the socket. The socket extends almost to the point, and buried in the apex is still apparently a part of the original wood shaft. There is a small circular hole for a rivet about $\frac{1}{4}''$ from the bottom. The spear weighs 2 oz. It is very similar in type to Fig. 25 on Plate V,, from Swine, figured in *The Naturalist* for May, 1917.

No. 2 is a spear head, much more massive, and longer, though of the same general type as No. 1. The sharp edges are unequal, and there is a distinct well-made groove on the blade at each side of the ridge. The spear is $7\frac{1}{2}''$ in length, $1\frac{5}{8}''$ across the blade, $\frac{7}{8}''$ across the socket, and a circular hole for a rivet occurs at a distance of an inch from the bottom. The socket for the shaft extends well on towards the point. The implement weighs 7 oz.

No. 3: the remains of a remarkably fine spear head, which has been cast hollow, and is broken away, exposing the socket on one side. The shaft and point are missing; what remains measures $7\frac{1}{2}'' \times 1\frac{1}{2}''$. Like No. 2, it has a pronounced groove on each side of the central ridge, and originally the blade was wider, but the cutting edge has been broken. When complete the spear-head was no doubt twice its present length, and would probably resemble the specimen from Heathery Burn Cave, Fig. 381 in Evans' 'Ancient Bronze Implements of Great Britain.' Weight, 5 oz.

No. 4 is a fragment of a Bronze-Age sword, the point and handle being missing. It is of the familiar type, with a very fine edge, accentuated by a depression $\frac{1}{6}''$ in width, which occurs on each side of the blade. This example measures $8'' \times 1\frac{1}{2}''$, and weighs $7\frac{1}{2}$ oz.

No. 5. The remains of a rare type of Bronze-Age implement, namely, a socketed dagger, an example of which, from North Lincolnshire, was figured in *The Naturalist* for September, 1917, on page 282. In the Whitby example, however, the

socket is broadly oval, and instead of knobs, has a circular hole bored through on each side of the socket, at a distance of ½″ from the base. The socket extends to the shoulder, the blade being cast solid. Unfortunately this has been rather badly used, the blade has been broken, about a half being missing, and a crude attempt has been made to sharpen the broken piece with the object of using it as a chisel. Extending from the shoulder of the handle is a low central ridge, on each side of which is a shallow groove, from the outer edge of which the implement is sharpened to a fine cutting edge. The total length of the specimen is 5½″; it is 1¾″ at the widest part, the socket measures 1½″×1 1/2″. Weight, 5 oz.

There are two winged axes of the Palstave type, which are cast solid. The first, No. 6, is very similar to the Hutton Cranswick example, shown on Fig. 24, plate IV., of *The Naturalist* for May, 1917. It is 4¾″ in length, 1¾″ across in the widest part, the cutting edge being 2⅜″ round. The wings are lozenge-shaped as usual, and 1¾″ in width. The axe has a roughened appearance, with fine particles of sand adhering. It probably owes this to the fact that it was buried in some peaty deposit.* Weight, 9 oz.

No. 7 is similar in type, but smaller, and has written upon it, in ink, ' Found at the foot of the Wolds near Malton, Yorks.' It is 4¼″ long, 1⅜″ along the cutting edge, the wings being 1⅙″ across. Weight, 6 oz.

No. 8 is a socketed axe of the usual pattern, very similar in type to the examples recently found at Scarborough.† Its outer surface seems to be scored, as though having been exposed on the sea-shore for some time. There are just traces of the usual three ridges extending from the collar; the marks where the halves of the mould came together are indicated, though more clearly on the side where the loop is. There are no ridges inside the socket, which extends quite close to the cutting edge. The specimen is 3¼″ long, 2″ along the cutting edge, and the socket measures 1⅜″ × 1½″. Weight, 6½ oz.

No. 9. This specimen, like the following, is evidently of Irish origin. It has a circular socket, and the cutting edge is without sharp corners at each end. Inside there are very pronounced ridges for secure shafting, so pronounced that they meet together at the apex of the **V**. The specimen is 3¼″ long, 2¼″ wide, and the socket 1½″ in diameter. Weight, 7½ oz.

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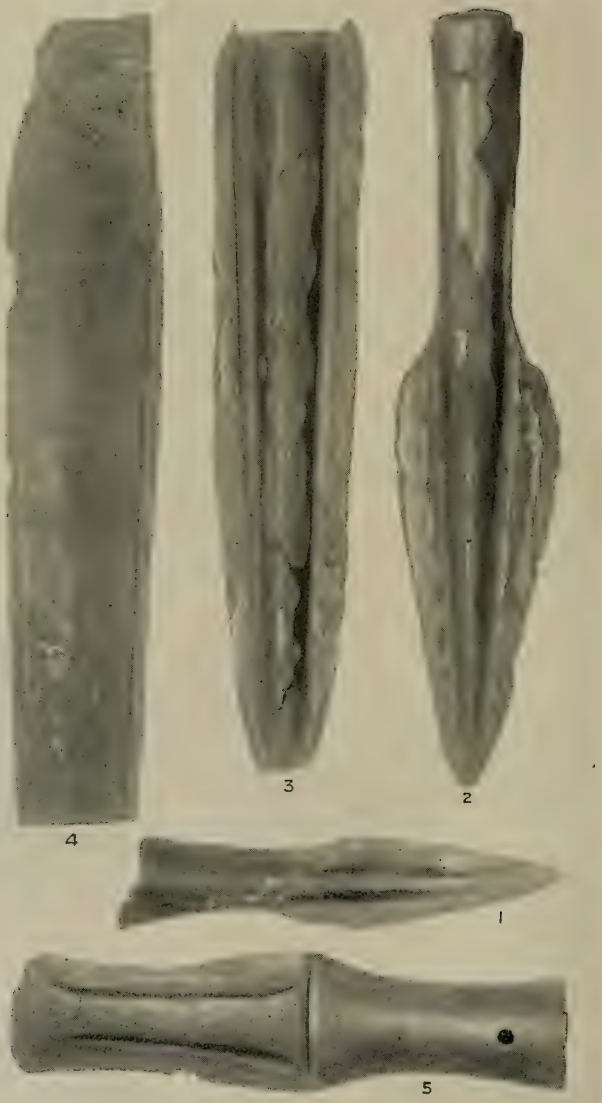
* In the Eighth Report of the Whitby Literary and Philosophical Society, p. 19, is a record of ' Two fine Celts found at Malton,' having been purchased. As No. 6 is similar in type to No. 7, which was from Malton; possibly these are the two referred to. In the Eighth Report, p. 8, it is recorded that ' Mr. Jos. Fletcher presented a prehistoric axe; no locality is given, nor does it state that the axe was of bronze.'

† See *The Naturalist*, May 1917, pp. 151-154.



Bronze Implements in the Whitby Museum.

Bronze Implements in the Whitby Museum.

No. 10 is of the same type as the preceding, excepting that the socket is oval, measuring $1\frac{3}{8}'' \times 1\frac{1}{8}''$, and at some time the cutting edge has been broken and re-sharpened. At the apex of the socket there are traces of a medial ridge for secure shafting. The specimen measures $1'' \times 2\frac{7}{8}''$, and weighs $3\frac{1}{2}$ oz.

Nos. 11 and 12 are almost identical, except that one has a hole at one side due to faulty casting. They are obviously forgeries, though in general shape and ornamentation the implements appear complete. The sockets are perfectly square in each case, and altogether give one the impression of being rather clumsy copies. Each one measures $3\frac{3}{4}'' \times 2\frac{1}{8}''$, the socket being $1\frac{1}{2}''$ across. Weight 9 oz. These are evidently the work of 'Flint Jack,' who was a native of the Whitby district, and spent some time there in later years doing his best to satisfy the demands of collectors. An example precisely similar to these two is in the case devoted to Flint Jack's work in the Mortimer Museum at Driffield, which is now the property of the Hull Corporation.

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How to Collect and Dry Flowering Plants and Ferns, by **H. S. Thompson.** Routledge, 1917. 7d. net. This little work of 56 pages, written by such a well known field botanist as Mr. Thompson, is full of useful hints to the young collector of dried plants. Many a naturalist of note has had his life-long interest in science fostered and developed by making such a collection, and if a beginner follows the advice given in this book he will be saved many disappointments and failures.

Ightham: A Story of a Kentish Village, by **F. J. Bennett, F.G.S., F.R.A.I.** [xii.] + 158 pp. Price 2/-. This is a cheap re-issue of the book which was published ten years ago. The present edition has the addition of four pages which refer to the papers dealing with subsequent discoveries in this interesting area; there is also a geological map, from the *South Eastern Naturalist* of 1908, and a Map of the District on the scale of half an inch to a mile, which do not appear in the first edition. A plate of Benjamin Harrison's Eoliths is also loosely inserted. Otherwise the book is the same, excepting that the former cloth cover is replaced by an artistic paper wrapper, and the price is cheaper. The story of Ightham is probably as fascinating as that of any village of its size in England, and Mr. Bennett tells it well. Mr. Benjamin Harrison, whose work among the Eolithic flints is known the world over, is responsible for an interesting section of the book.

British Grasses and their Employment in Agriculture, by **S. F. Armstrong.** Cambridge Press, 1917, pp. viii. + 199, 6/- net. Notwithstanding the great value of grass-land and its importance in this country, books dealing with grasses from the point of view of the Agricultural student are rare. This work is intended to fill the gap and the author has succeeded in producing a very useful volume. Part 1 deals in clear and readable terms with the morphology, structure and habitats of British grasses; there are keys to the vegetative and floral characters and also to the 'seeds' following with a long chapter on the description of species. Part 2 deals with the agricultural value of farm grasses, value and purchase of grass seeds, and seed mixtures; also the treatment of grass-lands. In an appendix is given a short account of rare and introduced grasses. There are 176 text figures, the drawings on the whole are clear and helpful, but some of the photographic illustrations of the inflorescences are not quite so successful. The book should prove a very useful guide to all interested in grassland.

MYCETOZOA OF THE AUSTWICK DISTRICT.

A. R. SANDERSON.

The district of Austwick near Clapham, by which is included the tract of country within a radius of about five miles of the village of Austwick, is singularly well adapted for the study of mycetozoa.

The varying altitude of the land surface 400 ft. to 2,000 ft., includes the low-lying mosses—Red Moss (Austwick Moss), Lawkland Moss, Helwith Moss, and from these, 450 ft., all gradations to the mountain heights of Moughton and Ingleboro, 2,000 ft., offering a variety of situation as regards altitude, suitable for both lowland and sub-alpine species.

A more important feature is the variety of the wooded areas. Many of the drier limestone parts are covered with a more or less dense hazel scrub, containing in some portions, a fair sprinkling of ash and often much undergrowth. The hill slopes (Ingleboro and Moughton), include areas of mixed woodland, some of considerable age, containing Oak, Birch, Beech, Ash, Sycamore, Mountain Ash, Larch, Pinus and Abies, such are, Moughton Plantation and Arco Wood to 1,000 ft. In a few places, notably on the summit of Moughton (1400 ft.), there is a dense patch of well-grown Juniper, many of the trees being of considerable size. On the slopes of Ingleboro and under Norber, are considerable areas of coniferous woodland, Raeside plantation on Ingleboro. 1,250 ft., and Dear-bought Plantation under Norber, 600 ft.

The numerous Ghylls provide narrow belts of mixed woodland, chiefly Ash, Mountain Ash, Birch, Oak and Hazel. The variety of woodland provides a consequent variety of diet or habitat, for a large number of species of mycetozoa many of which have a decided preference for particular species of wood. In most cases the woods abound with fallen trees and branches in different states of decay, while where felling has been undertaken in the past, the boles have been left to decay naturally. The mycologist finds a happy hunting ground in the many woods and ghylls, while the wet mosses, rich in decaying vegetation, add their share to the number of species. It is perhaps not surprising, then, that such a comparatively small district should yield over sixty species of mycetozoa, and the majority of these can be counted on at the proper season year after year. Probably the most important factor, however, in turning up so many species, is the thorough searching the district has been subject to, for, thanks largely to the valuable help of Messrs. C. A. Cheetham and W. H. Burrell, it has been thoroughly well worked at all seasons for the past seven years.

Perhaps the most outstanding feature is the extraordinary

abundance of the more common species; *Perichæna vermicularis* Rost., for instance—not by any means a common species for the county—was turned up on dead leaves of Hawthorn, grass, twigs, etc., along a quarter mile length of road—Slaidburn Road—practically every small mass of vegetable matter yielding a few sporangia of either the yellow or brown form. This species also occurred along the old lane from Austwick to Feizar, and in each case in the early part of the year—March to May, 1915 and 1916. *Lycogala epidendrum* Fries., appears in the Autumn in Trow Ghyll on the old Ash stumps in great abundance, it is no uncommon sight to see large masses of 12-24 good sized sporangia. *Brefeldia maxima* Rost., also on ash stumps in Trow Ghyll, which has again appeared this year, has been dealt with in a previous article (see *Naturalist*, July 1916, pp. 225-228).

Such species as *Physarum nutans* Pers., *P. viride* Pers., *Fuligo septica* Gmelin.—often on the cut surface of the more recently felled trees, though sometimes among the decaying herbage—*Hemitrichia clavata* Rost., *Trichia varia* Pers., *T. scabra* Rost., *T. affinis* de Bary, *T. decipiens* Macbr., *T. Botrytis* Pers., *Arcyria denudata* Sheldon, *A. ferruginea* Sauter, *A. cinerea* Pers., *Cribraria argillacea* Pers., and *C. aurantiaca* Schard., *Stemonitis fusca* Roth., *S. ferruginea* Ehrenb., *S. flavogenita* Jahn., etc., appear each year with great regularity, some of them in great abundance. I shall long remember the mass of *Tricha contorta* Rost., including the typical *T. contorta* with separate elaters, and the *Hemitrichia Karstenii* Lister, which occurred in Catrigg Ghyll this year, a large mass of logs and branches of Oak, Beech and Birch, but more particularly the Beech, being covered with the yellow or brown sporangia. I had never previously gathered more than a few sporangia of this species, but here there were many square yards of it.

Margarita metallica is here most cosmopolitan, fruiting, though always sparingly, on Oak, Beech, Ash, Birch, Pine, Fern leaves, grass and Hazel. *Prototrichia metallica* Mass., can usually be found, but always here on coniferous wood or bark, and seldom more than 6-10 sporangia together. The old Ash stumps in Trow Ghyll have probably provided the most striking masses of these organisms. On several occasions the stumps have been covered with sporangia of *Trichia varia* Pers., *Physarum nutans* Pers. (often apparently preferring partly charred portions), *Trichia scabra* Rost., *Trichia persimilis* Karst., *Hemitrichia clavata* Rost., *Arcyria denudata* Sheldon and *Lycogala epidendrum* Fries. It appears sometimes as if the various species were jostling one another to get to the surface for fruiting. One wonders how the various plasmodia have avoided getting in each other's way inside the wood, but

[1] 1918 Feb. 1.

obviously there must be plenty of food material for all. With careful searching even the more uncommon species can be counted on with a fair degree of certainty, at the proper season, and in the situations most suitable for them. This applies to such as the three species of *Dianema*:—*Dianema Harveyii* Rex., *D. depressum* Lister, and *D. corticatum* Lister. On two successive days, Mr. Cheetham and I have found all three species.

A perusal of the list appended will show that of the 60 species, two thirds (66 per cent.) belong to the non-calcarineæ, *i.e.*, those species which do not contain lime in the mature sporangia or stalk (if present). This is perhaps largely accounted for by the fact that by far the larger proportion are from dead wood rather than from straw, leaves, etc., on which a large number of the common lime forms occur. It is perhaps possible too, that even the so-called non-calcarineæ may in the plasmodium state contain lime salts, which are passed out from the plasmodium previous to fruiting, *i.e.*, just before the last stage in the life-cycle is commenced, whereas in the calcarineæ this operation takes place during the final stage in the life history of the organisms, and is therefore manifest in the sporangia or capillitium or both.

SPECIES OF MYCETOZOA FROM AUSTWICK DISTRICT.

Ceratiomyxa fruticulosa Macbr. Ash and Pine.
Badhamia utricularis Berk. On *Polystictus versicolor.*
B. panicea Rost. On Beech.
B. lilacina Rost. On grass (Red Moss) and sedges.
Physarum psittacinum Ditm. On Sycamore, Fern leaves.
P. viride Pers. On Sycamore.
P. nutans Pers. On dead wood leaves.
P. leucophæum Lister. On dead wood.
P. compressum Alb. & Schw. On grass.
Fuligo septica Gmelin. On Oak, grass.
Craterium minutum Fries. On leaves and grass.
Leocarpus fragilis Rost. On grass.
Diderma hemisphericum Hornem. On Sycamore and Oak twigs.
D. effusum Morh. On leaves and grass.
D. spumaroides Fries. On leaves and grass.
Didymium difforme Duby. On twigs, leaves and grass.
D. melanospermum Macbr. On Empetrum (Red Moss).
D. squamulosum Fr. On straw and grass.
Mucilago spongiosa Morgan. On grass, Helwith Moss.
Lepidoderma tigrinum Rost. On Birch.
Stemonitis fusca Roth. On Ash and Pine.
S. fusca var. *confluens* Lister. On Oak.
S. flavogenita Jahn. On Ash.

Stemonitis ferruginea Ehrenb. On Ash.
Comatricha nigra Schreoter. On Oak and Pine.
C. pulchella Rost. On Pine.
C. typhoides Rost. On Ash.
C. typhoides var. *heterospora* Rex. On Pine.
S. laxa Rost. On Pine.
Enerthenema papillatum Rost. On Ash and Pine.
Lamproderma scintillans Morgan. On Mountain Ash.
L. violaceum Rost. On Ash.
L. columbinum Rost. On Hazel twigs.
Brefeldia maxima Rost. On Ash.
Cribraria argillacea Pers. On Pine and Larch.
C. aurantiaca Schrad. On Pine and Larch.
Dictydium cancellatum Macbr. On Birch.
Licea flexuosa Pers. On Pine.
Enteridium olivaceum Ehrenb. Catrigg Ghyll. On Oak, Dec. 29th, 1917. New to Mid-West.
Reticularia lycoperdon Bull. On Birch and Willow.
Lycogala epidendrum Fries. On Ash and Pine.
Trichia affinis de Bary. On Ash and grass.
T. persimilis Karst. On Birch, Willow and Ash.
T. scabra Rost. On moss and Ash.
T. varia Pers. On dead wood.
T. contorta Rost. On Beech and Oak.
T. decipiens Macbr. On dead wood.
T. Botrytis Pers. On dead wood.
Hemitrichia clavata Rost. On Ash.
H. Karstenii Lister. Beech and Ash.
Arcyria ferruginea Sauter. Ash and Pine.
A. cinerea Pers. On Oak and Beech.
A. denudata Sheldon. On dead wood.
A. incarnata Pers. On Oak and Ash.
A. nutans Grev. On Ash and Pine.
Perichæna corticalis Rost. On dead wood and bark.
P. vermicularis Rost. On leaves and grass.
Margarita metallica Lister. Pine, Hazel, etc.
Dianema Harveyi Rex. On Ash.
D. depressum Lister. On Ash.
D. corticatum Lister. On Pine.
Prototrichia metallica Mass. On Pine.

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The 39th Annual Report of the St. Helen's Library and Museum is to hand, and we are glad to learn that the Museum collection continues to grow in importance. Several war trophies have been received.

The Report of the Winchester College Natural History Society, 1915-17, 86 pages, contains a useful summary of the various papers read before the Society, which cover most branches of Natural History. There are illustrations of some new Hybrid Orchids, and altogether the report is very creditable to this enthusiastic Society.

HEPATICS OF DENBIGHSHIRE.

WM. HY. PEARSON.

THE interesting paper on the Mosses and Hepatics of Denbighshire, by Mr. D. A. Jones, in *The Naturalist* for September, 1917, induced me to look through my herbarium to see if I had any records of my early botanizing in that county, and I have been able to find a few packets of hepatics collected many years ago.

My first visit was to Llangollen in April, 1874, and I find three packets of that date—(i) *Plagiochila asplenioides* L.; (ii) *Chiloscyphus polyanthus* L. (this I well remember collecting in a stone trough on the road to Berwyn, growing in great masses, this was the first hepatic I knew); and (iii) *Lophocolea bidentata* L. In May, 1875, I visited Llangollen again, and find two packets, one marked Castell Dinas Brân, which contains a few stems of *Frullania Tamarisci* L., and another marked Moel Sych, a mountain in the three counties of Denbigh, Merioneth and Montgomery, which I ascended on this visit with a non-botanical party.

It was a long and wearisome tramp, and from a botanical point of view, very uninteresting, for there were no rocks to climb, only a gradual ascent through bracken and heather, and that may account for the meagre result, for I can only find one small packet labelled Moel Sych. Perhaps another reason was that none of my companions cared anything for botany, one in particular had an open contempt for the study, and I can remember him quoting with derision from *The Friend*, 'What is Botany at this present hour? A huge catalogue. The terms, system, method, science are mere improprieties of courtesy, when applied to a mass enlarging by endless appositions, but without a nerve that oscillates, or a pulse that throbs in sign of growth or inward sympathy. The innocent amusement, the healthful occupation, the ornamental accomplishment of amateurs.'

At that time I was beginning to take an interest in mosses and hepatics, and another unappreciative companion failed to see what pleasure I could see in their study, or, as he said, in 'dirt sorting.' As I said, I have only been able to find one packet containing the spoils of that day, it contains *Diplophyllum albicans* L., one of the few hepatics beginners seem to be always collecting, and *Eucalyx obovatus* Nees., not in very good condition, but with care I have found a few involucres shewing paroicous inflorescences.

In May, 1877, I visited Llangollen again, but can only find one packet, which contains three species—(i) *Fossombronia pusilla* L., there is only a little of this, but one plant has a ripe capsule, and from the examination of the spores, there was no

difficulty in referring it to *pusilla*; (ii) *Haplozia pumila* With., with its paroicous inflorescence, of which I made quite sure, its small size, and its long, narrow, fusiform, smooth perianth separates it from *H. rivularis* Schiffner, which is a species more like a paroicous form of *H. riparia* Tayl. I was glad to spend again some time in the study of these two nearly-related species. The third species in the packet (iii.) was *Scapania compacta* Roth.

Specimens of *Cephaloziella Limprichtii* Warnst., listed by Mr. Jones, were sent to me by the collector, Mr. J. C. Wilson. These specimens must have been much more robust and perfect than those seen by Mr. Jones, and as they were in a fertile condition showing unmistakably paroicous inflorescences, with entire bracts, I referred them without doubt to *C. Limprichtii* Warnst.

Mr. Jones records *Ricciocarpus natans* L., found by Dr. Thomas, of Chester, in pond near Rossett, as new to Wales; in the Manchester Museum there are specimens of this species collected by G. Lloyd, June, 1842, in pond at Wrexham (*ex herb.* W. Wilson). I suppose the discovery has never been recorded.

Fossombronia pusilla L. and *Eucalyx obovatus* Nees, are recorded in the 'Census Catalogue' for VII., 50 (Denbigh), although not included in Mr. Jones's list, and *Haplozia pumila* With. is an addition.

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Coleoptera Notes from Huddersfield.—I took a *Necrophorus humator* from under a stone beside a field pathway at Thorn Bank, Birkby, on August 8th, 1917; and a few days before found a *Necrophorus ruspator* floundering in a vessel of water in an outbuilding in my garden. *Coccinella septempunctata* has been remarkably common in the upper part of the Wessenden Valley. When I visited that locality on Sept. 3rd last, this beetle simply swarmed—so much so that I had difficulty to walk without treading on some. I am not aware whether its occurrence at Wessenden is itself a record; but certainly its abundant presence at the time mentioned is noteworthy. *Blaps mucronata* has fully established its right to a place as one of the fairly common local beetles since the days when 'one in Swallow Street' constituted the only record.* During the past ten years or so I have very frequently seen specimens at various places in the town, and only a week ago picked one up in a back lane near my house. Other friends have also told me that they too have seen it many times.—CHARLES MOSLEY, Lockwood.

* Huddersfield Naturalists' Society's Monthly Circular, May 1891.

THE GEOGRAPHICAL DISTRIBUTION OF THE MOTHS OF THE SUBFAMILY BISTONINAE.

J. W. HESLOP HARRISON, D.Sc.

XV.—THE GENERA PHTHONOSEMA (WARREN), EUBYJA (WARREN), APHILOPOTA (WARREN).

Phthonosema tendinosaria (Brem.). Distribution :—The Ussuri and Amur Districts and Corea.

Eubyja grisea (Warren). South Africa.

Aphilopota subalbata (Warren). Orange River Colony, etc.

Aphilopota spissata (Warren). Natal, etc.

Aphilopota melanostigma (Warren). Angola, etc.

Aphilopota calaria (Swinhoe). British East Africa, etc.

Despite the fact that two of these genera are African and one Asiatic, there is a direct genetic connection between them of a character not unlike, although perhaps closer, than that between *Palæonyssia* and *Nyssiodes*. Undoubtedly, had *Phthonosema* and *Eubyja* occurred in the same zoogeographical regions, they would have been relegated to the rank of subgenera ; this fact alone is enough to stamp them indelibly as members of one chain—again, a chain with one of its terminal links located in Eastern Asia and thus emphasising the essentially Asiatic nature of the subfamily. Exactly as in *Biston*, the increased sexual dimorphism exhibited by *Phthonosema* shows that *Eubyja*, in many ways, more nearly approaches the common ancestor of both, which, from wing shape and general structure, in addition to the extensive development of the signum in the female bursa copulatrix, we judge to have been some form leaving the Amphidasyd highway just prior to the evolution of *Megabiston*.

Very early, then, preceding rather than following *Palæonyssia*, the original phase of the two radiated from the Far East, driving along the then more modest highlands of Central Asia and thence to Persia and Arabia. Here, in place of the fiery deserts of our age, it encountered the tree-clad uplands of the transition period between Miocene and Pliocene times ; no obstacle thus lay in its onward path. When, at length, what is now the Red Sea was reached, there it found a fertile river-valley, over which it crossed, passing on into Abyssinia and gaining the Great Central Plateau. Once the Abyssinian highlands had been attained a wide and unbroken route lay open to the broad and extensive tablelands of South and Central Africa to the furthest limits of which it has penetrated, and persists as *Eubyja grisea*.

Comparatively soon after its arrival in British East Africa, from it there arose a new development in the guise of *Aphilopota* which, even more emphatically than *Eubyja*, was fitted for

life in those upland regions. Not only was this so, but it was so very adaptable in its physiology as to be able to endure all the various conditions found on the enormous Central Plateaux to the remotest nooks of which, south, east, and west, it advanced.

However, such diverse climatic factors as it met with could not be without their inevitable effects; like all other virile genera under similar circumstances, it broke into several species, some broadcast and some local.

Subsequently, the disruptions and upheavals of Early Pliocene times in Arabia and Palestine, disastrous in their results, made the first gap in the continuity of the allied genera, to be followed much later by the further inroads already depicted as severing the genus *Biston* into two sections; thus we find *Phthonosema* situated in Eastern Asia and far away from it, its allies, *Aphilopota* and *Eubyja*, in Africa.

Nevertheless, however conspicuous this discontinuity may seem now, it is only too easy to obtain an exaggerated notion thereof. Careful examination of the map will show that its mileage is much less significant than that presented by the outliers of *Phigalia*, *Poecilopsis* and other genera.

Indeed, were it not that one extreme lay in the Far East of Asia and the other in the remote South of Africa, the advent of desert conditions would have, in itself, sufficed in our minds as an eminently satisfactory explanation of a state of affairs which, at first glance, appears so anomalous.

XVI.—THE GENERA EUBYJODONTA (WARREN) AND BUZURA (WALKER).

The genus *Buzura*.

Sub-genus *Buzura*. Species with male antennæ bipectinated.

Buzura suppressaria (Guen.). Distribution;—North India.

Buzura var. *benescripta* (Prout). Western China.

Buzura varianaria (Swinhoe). India.

Buzura abruptaria (Walker). Widespread around the Gulf of Guinea in Africa.

Buzura analiplaga (Warren). Hinterlands of Nigeria and the Senegal.

Sub-genus *Blepharoctenia* (Warren). Male antennæ subpectinate.

Blepharoctenia thibetaria (Obthr.). Tibet, etc.

Blepharoctenia bengalaria (Guen.). Bengal.

Blepharoctenia contectaria (Walker). North India.

Blepharoctenia perclara (Warren). Formosa.

Blepharoctenia arenosa (Warren). Java.

Blepharoctenia albescens (Warren). Java.

Subgenus *Amraica* (Moore). Male antennæ unipectinate.

Amraica recursaria (Walker). North India.
Amraica superans (Butler). Japan and China.
The genus *Eubyjodonta* (Warren).
Eubyjodonta emarginata (Leech). Western China.
Eubyjodonta quercii (Obthr.). Western China.
Eubyjodonta clorinda (Obthr.). Western China.
Eubyjodonta erilda (Obthr.). Western China.

On account of the obvious relationship between *Eubyjodonta* and the more primitive members of *Buzura*, for the sake of convenience, the two are taken together.

It would, however, be erroneous to assume that the main genus *Buzura* is a homogeneous whole; far from it, as comparison of its components, and the necessary division into subgenera upon structural characters drawn from the macro— and microscopical examination of the various antennal structures, proclaim.

In coming to any conclusion as to which of these are original, and which derived forms, we may proceed in different ways, one necessitating a study of the distribution and the other based on structure. We shall adopt the latter course and then see if it harmonises with the geographical distribution.

As may be perceived from our tabulation of the species given above, the types of antennæ exhibited by the genus are graded; first we have a group, the *Buzuræ* proper, displaying normal bipectinated antennæ; then follow the *Blepharocteniæ* with the antennæ subpectinated or even serrate and, lastly, the unipectinated *Amraica* fraternity. Now, without exception, all of the genera already reviewed, whether primitive or highly specialised, possess definitely bipectinated antennæ and the older the form, the more conspicuous the pectinations. Consequently, we must conclude that, in the subgenus *Buzura*, we have the modern representative of the original break from the Northern Amphidasyd line, and from it, necessarily the other two have arisen.

And this feature is exactly where *Buzura* comes in line with *Eubyjodonta*; if we lose sight of the scalloped margins of the latter genus there is but little indeed remaining to separate them. Plainly, therefore, these two are basal branches from the same main stem, and their centres of dispersal are to be placed in localities, if not exactly the same, then contiguous. But they occur cheek by jowl in Western China, whence we gather that not far from this region both set out on their wanderings.

Once again we have brought before us definite evidence that the Amphidasyds, as well as the *Bistoninæ*, originated as a whole in Eastern Asia. Still this difference is manifested that the majority of the Amphidasyd genera show distinct inclinations for warmer climates and are built accordingly; they,

therefore, were evolved to the south of the main group, which, whilst a creation of Eastern Asia, was still northern and temperate in its preferences.

Buzura arose in China and struck out soon after its development in all possible directions, the line of least resistance as regards climate being southward into India where, indeed, the conditions were so propitious that it spread far and wide in forms differing widely in wing-markings from the familiar *Buzura suppressaria*. When it proceeded forth on its travels, it was so clearly and well marked as to make it a worthy bearer of the name *benescripta* bestowed on it by Prout. Nor did it part with its wing pattern early, for it pressed onward unchanged over the lowlands which then linked up India and South Arabia from the Gulf of Cutch to the Kuria Muria Islands, and into Africa. Naturally favouring subtropical regions, it did not avail itself of the great highway open to it down the Great African Plateau. On the contrary, after it entered Africa, this event occurring almost certainly to the north of Abyssinia, it kept forging ahead and ever to the west until it was brought finally to a halt by the Atlantic Ocean. In consequence, it has been side-tracked into all the areas around the Gulf of Guinea where it has separated into the closely allied species, *Buzura abruptaria* and *B. analiplaga*, the disjunction proceeding from the difference between the coast belt of forest and the drier and less densely wooded hinterlands of Nigeria and Senegal.

In later days, in India, the *Buzura suppressaria* which went west in its migrations has shed its clear markings, and truly deserves the appellation *suppressaria* for, except for the powdering of darker scales, but few of the typical Amphidasyd markings are retained; yet, before this pattern degenerated, it had yielded the species *Buzura varianaria*.

To return to the species of which the genus consisted when it had but one exponent.

Gradually from it there emerged a form which, not needing the huge 'wireless' system of the primitive *Buzura* antennæ, cast it aside and thus gave the subgenus *Blepharoctenia*. This, too, must have been a later event, for when the insect migrated it found exit from India on the west impossible. Eastward and Southward, ground could still be gained and *B. thibetaria*, which is as close to the old form as we can get, spread eastward over the Chinese plains, in the end advancing into Formosa which then cannot have been an island. There its insular position has transmuted it into the species *B. perclara*.

The mass journeying into the Indo-Chinese Peninsula, at first seems to have been a broad one, streaming into India through Assam between the mountains and the coast, leaving by the way-side the form *B. bengalaria*. Finally it came to

a stop when no more lands remained for occupation, and settled in what it seized as the fine species *B. contectaria.*

Still, the whole of the migratory wave did not concentrate in India, a strong contingent came down through Annam and Siam and surged over lands like those uniting Formosa to the mainland, long since buried beneath the waves, passing as a narrow stream into Java to be found there yet as the two insects *B. albescens* and *B. arenosa.* This localisation in Java appears very curious but, nevertheless, is not more wonderful than the many problems of discontinuity with which the East Indian area teems. Possibly, sooner or later, the species will turn up in Borneo and Sumatra but up to the present they have not been signalled there.

Exactly as *Blepharoctenia* developed from *Buzura,* so *Amraica* appeared ; in its case the despised antennal pectinations not being shed by equal losses on both sides, but by the total disappearance of those on one side. How this came about is here of little importance, but what does affect us now is the fact that, like its congeners amongst the *Buzuræ,* east and west it advanced but evidencing a liking for temperate habitats, Japan being reached long ere its separation from China and Corea happened. Similarly, through passes of the lower Himalayas of its colonising days, it occupied the wooded foothills. In the end we know that the mountains of Northern India thrust their heads higher into the clouds and many parts of Tibet lost their woodlands ; where once the silva of temperate regions reigned dwell now only Junipers and miserable willows and poplars, and so, many insects vanished. *Amraica* was cut in two ; divergence to some extent ensued, and we obtain now what we regard as representative species, *Amraica recursaria* in India, and *A. superans* in Corea, China and Japan.

Returning for a moment to *Eubyjodonta,* it will not detain us long ; like many other active genera, soon after their birth, it had a period of great productive energy and gave rapidly, by slight variations, the four species *E. emarginata, E. quercii, E. clorinda* and *E. erilda* which have been content with their original home.

At this juncture it behoves us to take up the alternative scheme propounded as a mode of discovering which of the *Buzura* subgenera was to be considered the oldest. Which has led us further afield, and which has demanded geographical conditions furthest removed from those of our times ? The answer can only be the sub-genus *Buzura* proper, the very genus deemed from morphological standpoints to be of earlier origin. Agreement between the indications of structure and those of distribution is therefore perfect.

(To be continued)

CUMBERLAND COLEOPTERA IN 1917.

F. H. DAY, F.E.S.

In spite of many extremes in the weather, the season of 1917 was, on the whole, favourable to insect life. A long winter and late, backward spring, were followed by a period of genial conditions in June and July, when insects came out with a rush. August and September were less satisfactory owing to excessive rains, and collecting was limited in consequence. *Geodephaga* were numerous, almost all, however, being well-known species in this district. *Blethisa multipunctata* L. occurred abundantly at Thurstonfield Lough—a new locality. It favours the sloppiest ground on the margins of the Lough, and is very active in the sunshine. Various *Anchomeni* frequent the same situations, such as *viduum* Pz., *marginatum* L., and *piceum* L. On the Solway *Dyschirius angustatus* Ahr., was met with again, but required more patience than usual to find. *D. politus* Dj. was, however, abundant. Among a number of *Bembidion* var. *properans* Steph. (*velox* Er.), I got one of a dark blue colour, a form new to me, and to the county also I believe. I took many water beetles in various localities, the best perhaps being an example of *Hydroporus rufifrons* Duft. at Kingmoor. Eighteen years ago I took two specimens at Orton, since when it has not been noticed with us until now, although constantly searched for. The Orton locality is on the peat, while the Kingmoor specimen came from a small, artificial pond with a clay bottom. *H. discretus* Fair., also occurred at Kingmoor for the first time. It is a widely spread species in Cumberland but usually somewhat rare.

With regard to *Helophorus ytenensis* Shp., which I recorded last year (*Naturalist*, 1917, p. 93) as new to Cumberland from Thurstonfield, I have since found it in abundance at the same place, where it is the commonest *Helophorus*, in May at any rate. I also took it at Kingmoor. *H. mulsanti* Rye, was common at Port Carlisle on the Solway, in its usual habitat of brackish pools. These pools are often only a few inches deep, and clear, so that the *Helophorus* may be easily seen walking on the mud at the bottom of the water. A *Helophorus* which has been recorded several times from Cumberland is *affinis* Marsh, but studied in the light of Dr. Sharp's recent papers on the genus in *The Entomologist's Monthly Magazine*, the specimens in the fairly extensive series of both Mr. Britten and myself are undoubtedly *minutus* F., a common and widely distributed species, the real *affinis* being apparently rare. *Philydrus fuscipennis* Th., I took in fresh water ponds in several localities near Carlisle, *P. frontalis* Er. (*nigricans* Zett.) being attached to ponds on the peat. *Cercyon ustulatus*

1918 Feb. 1.

Preys. (*haemorrhous* Gyll.) was found on the edges of a pond near Kirkbride, and under half-decayed turnips close by.

Among numerous *Staphylinidae* taken, I may mention *Atheta granigera* Kies. (*crassicornis* Gyll.), *Gyrophaena affinis* Mann., *G. gentilis* Er., *G. fasciata* Marsh., and *G. bihamata* Th., all from a large *Boletus* on an ash tree in the Gelt woods, *Philonthus micans* Gr., and *Lathrobium quadratum* Pk., from Thurstonfield, *L. ripicola* Czwal., from mud banks near Kirkbride, *Trogophloeus elongatulus* Er. from moss at Kingmoor, and *Ancyrophorus aureus* Fauv., by sweeping round a pond at Orton.

The *Clavicornia* are not so well represented in Cumberland as some of the other groups of Coleoptera. The most noteworthy species I met with in 1917 were *Euplectus piceus* Mots., Kingmoor, under bark, *Anisotoma* (*Liodes*) *humeralis* Kug., and *Enicmus testaceus* Steph., in powdery fungi on birch stumps in the same localty, *Cis festivus* Pz. and *C. alni* Gyll. from *Polypori* at Gelt and Port Carlisle respectively, *Epuraea deleta* Er. also from Gelt. and *Cercus rufilabris* Lat., beaten from hawthorn on Cumwhitton Moss.

In the Nature Reserve at Kingmoor are a few aspen bushes, which for several years I have observed to show signs of the work of *Saperda populnea* L., and this year I met with the perfect beetle. *Asemum striatum* L. I took several times on the wing in Carlisle streets evidently disturbed from the pine plantations in the district by the felling operations so universal nowadays.

Grammoptera tabacicolor De G. was found in the Gelt Woods on raspberry bloom.

Among the Phytophaga, *Donacia discolor* Pz., was in swarms on the low herbage on Cumwhitton Moss, and all shades of colour almost were represented in green, blue, bronze and crimson, and some nearly black. *Apteropeda globosa* Ill., rather an uncommon species, was swept from *Geranium* in the Gelt Woods. I got a specimen of *Longitarsus nigrofasciatus* Goeze (*patruelis* Brit. Cat.), in flood refuse by the River Petteril. All my captures of this species have been made in the same way.

I did not get many weevils which call for comment, the most interesting, perhaps, being *Bagous limosus* Gyll. from Thurstonfield, the second Cumberland capture I believe, *Apion gyllenhali* Kirb. from Kingmoor, and *Phloeophthorus rhododactylus* Marsh, from Port Carlisle.

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The Entomologist's Monthly Magazine for December includes a description of '*Phanacis centaureæ* Förster, A Cynipid (Hymenoptera) New to the British Fauna,' from Durham, by Richard S. Bagnall, and Mr. G. T. Porritt records '*Limnophilus elegans* Curt. in Cumberland.'

FIELD NOTES.

BIRDS.

'Wild Geese,' or 'Gabriel's Hounds' (*Nat.*, January, 1918, p. 24).—I saw a flock flying over Rollerton near here about the date mentioned, viz., November 28th, 1917, and also heard the ' cart wheel ' sound of their cry, which in South Yorkshire foretells a funeral. My elder brother, who spent all his leisure winter time in wild-fowling off Spurn or on The Wash, always said they went across to the west and *vice versa* according to their natural intuition where their food was most plentiful.—ALBERT ERNEST HALL, Southwell, Notts.

Separation of the Sexes of the Chaffinch in Winter.—There is much conflict of opinion among naturalists as to whether there is any marked segregation in the sexes of the Chaffinch in Britain in winter. If, as Mr. Hudson says in his ' British Birds,' no separation takes place in the South and West of England, it is somewhat curious that White should so frequently refer to this separation in his district, where this species is abundant in winter, the flocks, however, he says, seemed to be almost all females. In this district (Wilsden) even in very mild winters we seldom see many female Chaffinches from end of November to February; they are nearly all males. One came to my garden window to be fed all last winter, but it had one leg much injured, and I saw another feeding yesterday (7th inst.) in the main street in Bingley. In northern Europe this separation of sexes is quite marked, mostly males are met with in this region, the females presumably wintering in a lower latitude.*—E. P. BUTTERFIELD, Wilsden, January 8th, 1918.

Long-Eared Owl Nesting on the Ground.—A pair of Long-Eared Owls built their nest on the ground at Bell Hole, near Hebden Bridge, in the summer of 1917, hatching two young, which, however, mysteriously disappeared. There seems to be an increasing tendency of this species to depart from its normal habit of nesting in trees. It was not my privilege to see either the birds or nest, and as the place seemed more suitable ground for the Short-Eared Owl than for the Long-Eared, it seemed natural to expect that the nest belonged to the former. Some feathers from within or around the nest, which were put into my possession, proved the surmise to be incorrect, as they were determined by Mr. T. A. Coward, F.Z.S., Bowden, Cheshire, who kindly compared them with others at the Manchester Museum, as belonging to the Long-Eared Owl. This is the first known case of the species nesting on the ground in this district. Mr. Coward adds that

* The separation of sexes is very marked in this district, where we see flocks both of male and female. Quite a number of males have frequented the vicinity of my house this winter.—R.F.

the number of occurrences of a similar kind which have recently been brought to his notice, is quite surprising.—WALTER GREAVES, Hebden Bridge.

Curious behaviour of a pair of Song Thrushes (*Turdus musicus*).—Last Spring a pair of Song Thrushes built its nest in a yew bush in the garden, almost opposite my sitting room window, in such a position that as I sat smoking my after-breakfast pipe I could watch practically their every movement. After the nest was completed and the lining dry, the hen (or what I took to be the hen) used to sit in the nest each morning day after day for about half an hour to an hour, but no egg was laid. Then the birds disappeared, and I naturally concluded that the nest was forsaken. But after an interval of perhaps a fortnight, they reappeared, and the same proceeding went on again for days but there was never any egg laid. That the birds were paired was clear, because often whilst the hen was on the nest, her mate was with her sitting on a branch within a few inches of the nest. Quite five or six weeks I think must have elapsed between the making of the nest and the final disappearance of the birds, which did not build again in the garden, nor anywhere else so far as I could ascertain.—GEO. T. PORRITT, Elm Lea, Dalton, Huddersfield, January 5th, 1918.

Scarcity of the Bulfinch in Upper Airedale.—The Bulfinch is said to be such a common and generally distributed bird, that it may cause surprise to some ornithologists, to be informed that, except during the autumn and to a lesser degree in winter, this species is hardly ever seen in Upper Airedale. In the autumn here I have not unfrequently seen it feeding upon elderberries, of which it is very fond, but I have never yet found its nest, although a friend of mine used to tell me he had found the nest about St. Ives, which is about a mile and a half away. It is much more common in the breeding season in some parts of the adjoining valley, that is in Wharfedale, and it is said to have been much more common in Airedale in former years, but this cannot include the last half a century. Tunstall, in 1786, states that this species was plentiful in the north of Yorkshire, and Allis, in 1844, wrote that it was common in some parts, but becoming scarcer in others. On the 2nd inst., whilst taking a walk on the western boundary of Bingley Wood, I was agreeably surprised to see two Bulfinches in a spruce tree, and on my approach they flew into a birch, and began at once to eat the buds. I was more surprised still to see one feeding upon the seeds of dock in my poultry run on the 12th inst. When first seen it was some distance away and I could see its white rump (this being the only feature that attracted my attention) flitting from plant to plant. I took it to be a Mealy Redpoll, which I have occasionally seen feeding

upon the seeds of meadow-sweet. This rarity of the Bulfinch in some parts of Airedale, especially during the breeding season, can scarcely be attributed to a lack of suitable food, but must be assigned to some other causes. The relative distribution of many, if not most of our birds is so little understood that one could wish for a monographer, not only in every district but in every locality.—E. P. BUTTERFIELD, Wilsden, December 16th, 1917.

Pied Wagtails in Winter and on Migration in the Bradford District. — I think that my friend, Mr. E. P. Butterfield, is not strictly in accordance with the known facts when he states that in most winters this species 'leaves this district to a bird' (*ante* 1917, p. 391). Although roughly speaking the Pied Wagtail may be considered almost non-existent in the neighbourhood during the darker months—say November and December; still it has been proved over and over again in the past twenty-five years by the members of the Bradford Natural History and Microscopical Society, that there is not any month in the winter but that a single bird or two may be reported. Usually it is a dirty, bedraggled specimen at a sewage bed, mill dam, or some such similar place. Occasionally they have been reported from the lakes and ponds of our public parks in the depth of winter. The great majority of Pied Wagtails leave this district in September, though it is rarely that we see them in such numbers as Mr. Butterfield describes as seen by him in September, 1916; which would most probably consist of birds that had nested further north, and their families. They usually work their way leisurely through the district in family parties, or in collections of family parties. In spring, however, there is generally a large and well-defined immigration of Pied Wagtails near Saltaire, commencing as a rule on the last day or two in March or early in April, and continuing until the 8th or 10th of April. At the commencement of this movement the males are in the majority by well over 90 per cent., and gradually the percentage is lowered; although it is evident that many of the females must follow much less ostentaciously later on. It is a curious fact that I have never been able to observe this great March-April movement in Wharfedale—only eight miles away from Saltaire—but in another valley separated by a fairly high moor. In Wharfedale the spring movement appears to be leisurely throughout and similar to the autumn exodus. If these spring immigrations are carefully watched, and the birds individually and carefully scrutinised with a good pair of field-glasses, a few male White Wagtails may be recorded from time to time. A few females of the same species may also be present, but I have great difficulty in satisfactorily identifying them unless in the company of the

males. The statement made by Mr. Butterfield that, in spite of the winter of 1916-7 having been a long and dragging one, yet more Pied Wagtails were seen about than usual, was confirmed by the observations of Mr. F. Rhodes in Lister Park, Bradford.*—H. B. Booth, Ben Rhydding.

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MOLLUSCA.

***Paludestrina minuta* in Lincs.**—On August 25th, 1904, I collected a considerable quantity of very small Paludestrina, thickly encrusted, from a drain between Grainthorpe Haven and 'The Fitties,' which did not appear to be referable to *P. ventrosa* and have therefore remained unidentified until quite recently. In consequence of recent notes by my friend, A. S. Kennard, F.G.S., I sent some of this collection to him which he has identified as *Paludestrina minuta* (Totten). Associated with them were a few small *P. ulvæ* (= *stagnalis*), but, unlike *P. minuta*, these were not encrusted. This interesting species has only recently been detected in the British Islands.—C. S. Carter, Louth, Lincs.

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LEPIDOPTERA.

***Agrotis obscura* Brahm (*ravida* Hb.) at Bubwith, East Yorks.**—During the past season I have examined the inside of the bedroom windows of my house at dusk and have found moths extremely abundant. The windows were left open at the bottom for the moths to enter, and although no light was shewn it was usual to capture about half a dozen specimens on each window. The majority of these were such abundant species as *Mamestra brassicæ* L., *Triphæna pronuba* L., and *comes* Hb., *Amphipyra tragopogonis* L., *Hadena oleracea* L., *Xylophasia monoglypha* Hufn. and *Apamea didyma* Esp. (the latter species in bewildering variety and easily exceeding the others in point of numbers); but there were a few other species represented and among these latter is a specimen which Capt. H. D. Smart, M.C., R.A.M.C., on looking over the collection, recognised as *Agrotis obscura* Brahm. This species is rare in Yorkshire except on the coast, but has been taken in the East Riding at Hull. Its nearest inland locality to Bubwith is Askham Bog.—Wm. J. Fordham, Bubwith, December 5th, 1917.

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HOMOPTERA.

Homoptera of West Cumberland.—The following species of Homoptera were met with in the neighbourhood of Seascale,

* A party of Pied Wagtails, about 20 in number, passed over my house on Jan. 10th, about 3-30 p.m., flying direct from N.E. to S.W. A smaller party passed over about the same time on the following afternoon. For some reason which I have not been able yet to determine, my house seems to be in a direct line of a regular wagtails' flight.—R.F.

except where otherwise noted, during the early part of last July :—*Aphrophora alni* Fall., common in Eskdale. *Philænus spumarius* Linn. common ; the form *lateralis* Linn., several, and the form *lineatus* Fab., common in Eskdale. *P. exclamationis* Thunb., common, Drigg and Eskdale. *P. lineatus* Linn., common. *Megophthalmus scanicus* Fall., several by sweeping a rough meadow. *Euacanthus acuminatus* Fab., Gosforth, just coming on. *Oncopsis flavicollis* Linn., the var. 4 of Edward's ' Homoptera ' was not uncommon in Eskdale. *Deltocephalus abdominalis* Fab., common on rough ground near the sea. *D. distinguendus* Flor., common. *D. pulicaris* Fall., Eskdale, common. *D. sabulicola* Curt., common. *Thamnotettix subfusculus* Fall., Eskdale. *Eupteryx signatipennis* Boh., Drigg, sweeping in a lane. *Cixius cunicularius* Linn., one swept in Eskdale. *Delphax difficilis* Edw., in Eskdale. *Dicranotropis hamata* Boh., common in Eskdale. *Stiroma albo-marginata* Curt., common. *S. pteridis* Boh., in Eskdale, by sweeping ferns. *Psylla nigrita* Zett. (*pineti* Flor.) was common on some young Firs, and a few *P. spartii* Guer., were beaten from Broom. Mr. E. A. Butler, has kindly assisted me in determining some of these, and also some of the Heteroptera recorded *antea* p. 27.—JAS. MURRAY, 2 Balfour Road, Carlisle.

——: o :——

The subscription to *The Scottish Naturalist* has been increased to 7/6, and the subscription to *The Entomologist's Monthly Magazine* is now 9/-.

The Gardeners' Chronicle for December 22nd and 29th, contains an article on the botany and physical geography of the Holy Land, from the pen of Mr. J. G. Baker, F.R.S.

The Brighton and Hove Natural History and Philosophical Society has issued its ' Abstracts and Reports for the year ending July, 1917,' 42 pages. Some of the abstracts have a bearing upon the Society's district, and there are also accounts of rambles.

Mr. R. Bullen Newton, F.G.S., of the Geological Department, British Museum, has just completed 50 years of Government service. On January 8th, 1868, Mr. Newton was one of the assistant naturalists of the Geological Survey, under the late Prof. Huxley, and was transferred to the British Museum in August, 1880.

Referring to the notes on the prevalence of anopheline mosquitos in this country, which appeared in *The Naturalist* for November last, p. 339, Mr. A. J. Grove, c/o The Medical Officer, Local Government Board, Whitehall, S.W. 1, is now putting the records together, and would be glad to receive any notes on the subject from readers of this journal.

The Selborne Society has been incorporated under the Companies' Act, and from a legal standpoint, the Society will become a limited liability company. We understand from *The Selborne Magazine* for January, that in the event of the winding up of the Society, therefore, each member must contribute a sum not exceeding one of their annual subscriptions.

The Lancashire and Cheshire Naturalist for November contains, among other items, the following :—Leach's Fork-tailed Petrel near Manchester, by T. A. Coward ; Notes on the Local Captures of Longicorn Beetles during 1917, by J. R. Hardy and R. Standen ; *Litargus bifasciatus* Fab. in Cheshire, by J. R. Hardy ; and ' On the Collection, Taxonomy and Ecology of the Sphagna,' by J. A. Wheldon.

NEWS FROM THE MAGAZINES.

In *The Scottish Naturalist* for January Alexander Meek describes 'The Migrations of *Chimæra monstrosa*.'

A paper on 'Bronze and Tin in Cornwall,' by the late Clement Reid, in *Man* for January, has an important bearing upon the origin of Bronze-age implements.

The Entomologist's Record for January is a 'Special Index number, with six plates' (2/-). It contains a note on 'The Pairing Habits of Certain Bees,' by Dr. J. W. H. Harrison.

Prof. S. J. Hickson describes 'The Pennatulacea of the *Siboga* Expedition, with a General Survey of the Order' (Leyden, 256 pp.), a summary of which appears in *Nature* for January 17th.

In *The Irish Naturalist* for November and December, Mr. R. F. Scharff has an interesting paper on 'The Irish Pig,' some peculiar examples of which are illustrated. He also refers to the Wild Pigs of the island.

In *The Entomologist* for January, Dr. J. W. H. Harrison writes on 'Rare Hemiptera-Heteroptera in the North Eastern Counties,' and Dr. Eric Drabble and Hilda Drabble continue their notes on Derbyshire Diptera.

The Scottish Naturalist for December contains articles on 'Wild Life in a West Highland Deer Forest,' by Dr. William Eagle Clarke, and a general account of the occurrence of the Convolvulus Hawk-moth in Scotland, as well as many shorter notes.

The Journal of Conchology for January contains Prof. A. E. Boycott's Presidential Address on 'The Habitats of Freshwater Mollusca'; Mr. A. W. Stelfox writes 'On the Recent Misapplication of the Names *Pisidium nitidum* and *Pisidium pusillum* of Jenyns,' and there are other interesting notes.

The New Phytologist for December contains a lengthy appeal for the Reconstruction of Elementary Botanical Teaching which should be carefully considered by those interested in the future of Botanical Science. We notice that criticisms are desired, and that 'Contributors are urged to write exactly what they think on any or every aspect of the subject'

In *The Entomologist's Record* for December, there is a note on 'Butterflies in North Yorkshire' by T. A. Lofthouse, which contains the observation that 'there appears to be no doubt that long severe winters are favourable to insect life, especially the butterflies, and a series of these would probably go a long way to re-establishing many species that have become very scarce in recent years.'

British Birds for January has 'Notes and Observations on the Moor-Hen,' by Frances Pitt; 'The Moults and Sequence of Plumages of the British Waders,' by Annie Jackson; 'The Hooded Crow in Warwickshire,' by A. G. Leigh; Report of the 'Recovery of Marked Birds,' and shorter notes, including records of the Black-Throated, Red-throated, and Great Northern Divers on Lake Windermere.

Wild Life for November and December completes Vol. IX. Among the contents we notice 'Abnormal Colour in Mammals,' by Fred D. Welch; 'Resting Attitudes of Moths and some Notes on their Habits,' by C. W. Colthrup; 'Economic Ornithology,' by W. Berry; 'Notes on the Butterflies of the Oxfordshire Chilterns,' by G. Abbey; 'Some Further Notes on the Cuckoo,' by E. E. Pettitt; 'Jottings on Polecats and Martens,' by G. Abbey, and 'Sexual Selection in Birds,' by Edmund Selous.

Among the contents of *The Vasculum* for December, are the following items, together with shorter notes: — Our Local Seaweeds, by W. H. Young; Eyeless Migrants, by J. E. Hull; Notes on the Winter of 1916-17 in the Alston District, by George Bolam; Birtley Fell, by J. W. H. Harrison; Grant Allen on Floral Colour, by J. E. H.; The Convolvulus Hawk-Moth, by George Bolam. The Rev. J. E. Hull's paper contains illustrations and description of a new species. 'Last winter' has certainly seemed a long one to some of us, but we hope that the date '1616-1917' given in Mr. Bolam's paper is a mis-print.

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London : A. BROWN & SONS, Ltd., 5 Farringdon Avenue, E.C.

And at Hull and York.

Printed at BROWNS' SAVILE PRESS, 40, George Street, Hull, and published by A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London. Feb. 1st, 1918.

MARCH 1918. No. 734
(No. 508 of current series)

THE NATURALIST

A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

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Garner. Nos. 4, 8, 12, 60.
Lancs. and Cheshire Antiq. Soc. Vols. IV., V., VIII., XXVI.
Discovery. (Liverpool, 4to). 1891.
Louth Ant. and Nat. Soc. Reports, 1-14, 17-19.
Alford Nat. Hist. Soc. Reports.
Union Jack Naturalist. Any.
Archæologia Cantiana. Vol. I.
M. Simpson's Guide to Whitby. 1st ed. [before 1881].
Internat. Journ. Micros. and Nat. Sci. 1891-97.
Journ. Micrology and Nat. Hist. Mirror. 1914–
Young and Bird. Geol. of Yorks. Coast. 2nd ed. 1828.
Derby Arch. and Nat. Hist. Soc. Parts 20, 21.
Journal Marine Biological Assoc. Vols. I.-IV.
Croydon Nat Soc. 6th Report, and Trans. for 1887-8.
Yorks. Ramblers' Club Journal. No. 8.
Newbury District Field Club Transactions. Vols. III. and on.
Reports Wakefield Lit. and Phil. Soc. Set.
Proc. Birmingham Nat. Hist. and Phil. Soc. Vol. I., part 2.
Proc. Soc. of Antiquaries. 1st Series, Vols. I. and II.
Trans. Manchester Geol. Soc. Vols. XV., XVI., XIX.-XXIII.
Trans. Barrow Nat. Field Club. Vol. VII.
Dudley and Midland Geol. etc., Soc. 1862-80 (14 parts).
Vale of Derwent Nat. Field Club. Old Series, Vols. I.-III.
Salisbury Field Club. Transactions, Vol. II.
Trans. Norfolk and Norwich Nat. Soc. Vol. IV., Pt. 3.
Peterborough Natural History Society. Reports, 1-8, 11-12, 14-26.
Brighton and Sussex Natural History Society Reports, 1855-1870; 1872-3.
North Staffordshire Field Club Reports for 1869, 1871-2, 1876.
Bedfordshire Natural History Society Proceedings. Set.
Trans. Royal Cornwall Geological Society. Vol. V. to date.
Chester Soc. Nat. Science: Ann. Reports, i.-iv.
Trans. Woolhope Club. 1866-80.
Quarterly Journal of Science. 1878-9, 1882-3, and 1885.
Trans. Geol. Soc., London, 4to. 2nd series, Vols. IV.-VII. (1836-56).
Geological Magazine, 1890-1-2-4.
Mackie's Geol. and Nat. Hist. Repository. Vols. II., III.
Proc. Liverpool Geol. Association. Parts 1, 3, 7, 16.
Reliquary (Jewitt's 8vo. Series). Vol. XXII.
Irish Naturalist. Vols. 1912-16.
Scottish Naturalist. 1881-95.
Annals of Scottish Nat. Hist. 1905-1916.
Walford's Antiquarian Mag. and Bibliographer for July-Dec., 1885.
Keeping's Handbook to Nat. Hist. Collections. (York Museum).
Huddersfield Arch. and Topog. Society. 4 Reports. (1865-1869).
First Report, Goole Scientific Society.
The Naturalists' Record. Set.
The Naturalists' Guide (Huddersfield). Parts 1-38.
Reports on State of Agriculture of Counties (1790-1810).
Early Geological Maps.
Quart. Journ. Geol. Soc. Vols. I.-XIV.
Proc. Geol. Assoc. Vol. I. Part 1.
Trans. Yorks. Nat. Union. Part 1.
Naturalists' Journal. Vol. I., and parts 44, 56, 61, 115, 116.
W. Smith's New Geological Atlas of England and Wales. 1819-21.
Frizinghall Naturalist. (Lithographed). Vol. I., and part 1 of Vol. II.
Illustrated Scientific News. 1902-4. (Set).
Journal Keighley Naturalists' Society. 4to. Part 1.
Cleveland Lit. & Phil. Soc. Trans. Science Section or others.
Proc. Yorks. Nat. Club (York). Set. 1867-70.

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NOTES AND COMMENTS.

G. W. LAMPLUGH, F.R.S.

All naturalists will join us in sincerely congratulating a past-president of the Yorkshire Naturalists' Union, Mr. G. W. Lamplugh, F.R.S., F.G.S., on his election as President of the Geological Society of London, in succession to Dr. Alfred Harker, another of our past-presidents, a post previously held by our last President, Sir Archibald Geikie, O.M., K.C.B. Mr. Lamplugh's election is a fitting answer to the subject of his presidential address to the Union, which was 'The Amateur Spirit in Scientific Research' (see *The Naturalist*, 1906, pp. 71-80). Mr. Lamplugh was, and is, essentially an amateur. While living at Bridlington, years ago, he published a series of valuable papers on the Glacial and Cretaceous Geology of that District, his paper on the Speeton Clays being a classic, and his 'Drifts of Flamborough Headland' has been rightly styled one of the gems of glacial literature. These two papers appeared in the *Quarterly Journal of the Geological Society*, but the *Proceedings of the Yorkshire Society* have contained much of his work, and *The Naturalist* has frequently been favoured by notes from his pen. He joined the Geological Survey in 1892, and was appointed Assistant Director in 1914. He has been responsible for the Memoir on the Geology of the Isle of Man, as well as valuable work in Ireland, the Midlands, and the Weald District. His paper on the Crush Conglomerates of the Isle of Man opened an entirely new chapter in the Geological History in these Islands. We trust he may long be spared to carry out the useful work he is doing.

LIVERPOOL BOTANISTS.

The Proceedings of the Liverpool Botanical Society for the years 1912-15, have recently been issued (40 pages), the frontispiece to which is a portrait of Mr. A. A. Dallman, who was President 1914-5. There are notes on the South Lancashire Flora, and details of the various exhibits, etc., at the meetings between January, 1912 and December, 1915, which contain many interesting botanical records. There is a substantial list of additions to the Library, a list of members, and an 'In Memoriam' notice of Mrs. J. A. Wheldon, wife of a former president. We certainly think our Liverpool friends are wise in recording their work in this way.

THE HEDGEHOG.

We have recently obtained a copy of a 'new edition' of Oliver Goldsmith's 'History of the Earth, and Animated Nature,' printed at York by Thomas Wilson & Son, High Ousegate, 1808. It is in four volumes, each of which contains over 400 pages and numerous quaint plates. In Volume II., pp. 307-310, is a description of 'The Hedgehog, or Prickly Kind.' The author places the hedgehogs 'in a class by them-

selves ; nor let it be supposed, that while I thus alter this arrangement and separate them from animals with which they have been formerly combined, that I am destroying any secret affinities that exist in Nature.'

OF TWO KINDS.

' The hedgehog, with an appearance the most formidable, is yet one of the most harmless animals in the world : unable or willing to offend, all its precautions are only directed to its own security ; and it is armed with a thousand points, to keep off an enemy, but not to invade him . . . . This animal is of two kinds ; one with a nose like the snout of a hog ; the other more short and blunt, like that of a dog. That with the muzzle of a dog is the most common . . . . They sleep

away the winter, and what is said of their laying up provisions for that season is consequently false. They at no time eat much, and can remain very long without any food whatsoever. Their blood is cold, like all other animals that sleep during the winter. Their flesh is not good for food ; and their skins are converted to scarce any use, except to muzzle calves, to keep them from sucking.'

ANCIENT NATURAL HISTORY.

The above, together with much other information, some quaint, some trustworthy, some neither, is the sort of natural history that was published just over a century ago. The description appears towards the end of Volume II., and the illustration, which we reproduce herewith, appears on a plate at the front of Volume I., though a good index enables the description to be traced. No reference whatever is made in the text to the ' Hedge Hog *without Bristles.*'

HEDGEHOG WITHOUT SPINES.

This reminds us that some years ago, in *Natural Science*, appeared an illustration of a Hedgehog without spines,* which is also reproduced herewith. The specimen was in the Royal Bohemian Museum, and was originally figured in the official *Bericht* of that Museum for 1897. 'In this specimen there are none of the characteristic spines, the whole body being clothed instead with normal hair. Spines, of course, are only highly modified hairs, and this individual is doubtless to be

regarded as an example of atavism, one in which the dermal appendages have reverted to their original condition.

SANDS AND ROCKS USED IN GLASS MANUFACTURE.

Messrs. Longman, Green and Co. have recently issued 'A Supplementary Memoir on British Resources of Sands and Rocks used in Glass Manufacture, with certain Refractory Materials,' by P. G. H. Boswell* which, besides the general remarks on the methods of examination, includes descriptions of sands from the various counties in England, notes on their suitability for glass-making, etc. In addition there are three maps, and a number of plates showing samples of sand.

AUTHORS' REPRINTS.

The Library of the late F. W. Rudler, consisting of two thousand volumes and four thousand pamphlets will, in future, be available to students at the University College of Wales, Aberystwyth. It is much to be desired that such life-long collections of specialists should be preserved in this way, as it

* *Nat. Sci.*, Sept., 1898, plate II.
* 92 pages, price 3/-

frequently happens these collections of pamphlets and authors' reprints are of exceptional use to later students working on the same lines. The present writer, for instance, has the collections of authors' copies formed by the late Gwynn Jeffreys, the late Sir Andrew Ramsay, the late C. P. Hobkirk and others, which in each case should have been lodged in some permanent institution.

MICROSCOPIC SECTION OF COAL SEAM.

At a meeting of the Leeds Geological Association, held at the Leeds University recently, the Chairman (Professor Kendall) drew the attention of the Association to an interesting gift which has been made to the University by Sir William Garforth, the head of the Altofts Colliery. It consists of a complete thin section, in column, of every layer of one of the principal coal seams in the Yorkshire coal-field. The gift was of immense economic importance, showing as it did the various layers of coal in such a way that it was possible to discover which particular seams were liable, by spontaneous combustion, to cause gob fires Professor Kendall characterised the making of the section as being unique. It was the work of Mr. James Lomax, and his son, of Bolton, Lancashire, and it was gratifying to know that there were two men in England capable of this astonishing feat. He knew of no other country in the world where such a coal section, showing the constitution of coal at every stage of its growth, had been prepared.

PEAT PROBLEMS.

At the same meeting a paper on 'Peat Problems,' with lantern illustrations, was read by Miss Elsie D. Whitaker, who is the first woman to whom a Leeds University fellowship has been awarded. Miss Whitaker's paper dealt with the properties and origin of peat in their relation to the formation of coal, and gave an account of various North-country accumulations of peat, mentioning as two of the main types those at Goole and at Thorne, near Doncaster. Pointing out that, at the present time, research work in peat was divided into two distinct classes, scientific and commercial, Miss Whitaker urged that it would be well, in the interests of both science and industry, if the two branches of study could be more closely allied.

LIGHT AND PHOTOTROPISM.

At a recent meeting of the Linnean Society of London, a paper was read by Harold Wager, D.Sc., F.R.S., F.L.S., entitled 'Intensity and Direction of Light as Factors in Phototropism,' and illustrated by lantern slides and models. In this communication an account is given of experiments made to determine the influence of the intensity and the

direction of light in effecting phototropic responses in foliage leaves. In accordance with the teachings of physics we may assume that it is only the light absorbed by the photo-sensitive elements of a stimulable plant organ that is capable of setting up a phototropic stimulus. The light rays penetrate the tissues unequally but symmetrically. The extent to which this takes place can be shown by means of a simple piece of apparatus which may be called a Phytentoscope. By keeping the photo-sensitive region of a foliage leaf in a fixed position it can be shown that the orientation to light is determined by the varying extent to which the rays of light penetrate the photo-sensitive elements. The photo-sensitive elements of a foliage leaf probably consist of parenchymatous cells in the apical region of the leaf-stalk. Experimental evidence is brought forward to show that it is probably mainly in the cortex that the stimulus is received and transmitted. There is no evidence to show that the epidermis and pith take any large part in the process.

PHYSICO-CHEMICAL ACTIVITIES.

If the phototropic response is due to the physico-chemical changes set up by the light absorbed, then it follows that —

(1) The intensity of the physico-chemical changes depends upon the amount of light absorbed.

(2) The extent to which the light is absorbed depends upon (*a*) the degree of penetration of the light, and (*b*) upon the selective absorption of the photo-sensitive elements.

(3) The degree of penetration depends upon (*a*) the intensity of the light that impinges upon the stimulated region, and (*b*) upon the angle or angles at which the incident rays strike it.

We see, therefore, that the distribution of the physico-chemical activities in the photo-sensitive tissues is dependent upon both intensity and direction of light, and since the direction of movement may be determined as the resultant of the varying physico-chemical activities in the whole of the sensitive region, we must conclude that both intensity and direction of light are necessary factors in the phototropic response.

SPORE COLORATION IN THE AGARICACEÆ.

Dr. Wager read a second paper entitled ' Spore-Coloration in the Agaricaceæ.' He stated that the use of spore-coloration as a basis for the classification of the Agaricaceæ is artificial and imperfect. There is no clear line of demarcation between the various colours, and the designation of the colours in the text-books is very indefinite and unsatisfactory. A beginning, has, however, been made by members of the Mycological

Committee of the Yorkshire Naturalists' Union to obtain more accurate records of spore-coloration in terms of a standard series of tints, such as that of the 'Code des Couleurs,' by Klincksieck & Valette (Paris, 1908). We have already found—and this may be a fact of some considerable physiological interest—that, with one or two doubtful exceptions, all the spore colours so far standardized, whether pink, rusty, or purple, fall within the region of the less refrangible half of the spectrum. Spectroscopic examination also shows this. It has been suggested by Buller that these colouring-matters may serve a useful purpose by screening off certain of the sun's rays from the living protoplasm. If this is so, we ought to find some support for the hypothesis in the more abundant distribution of the coloured-spored species in the open and of the white-spored forms in the shade.

TABULATING HABITATS.

On tabulating the records of habitats, it has been found that we get approximately :—

Black-spored forms : 24% occurring in the shade, 76% in the open.
Purple ,, ,, 30% ,, ,, ,, 70% ,, ,,
White ,, ,, 90% ,, ,, ,, 10% ,, ,,

These figures suport the hypothesis.

The pink-spored forms gave :—

34% in the shade, 66% in the open.

This is intermediate, as might have been expected, between the dark-spored and the white-spored species. The brown or rusty-spored forms, however, gave figures not quite so good viz. :—

52% in the shade and 48% in the open.

These figures are only approximate, however, as they are compiled from a list of habitats which is probably not very accurately determined as regards light and shade. Spore-coloration may, however, depend, partly at least, upon the kind of substratum on which the Fungi grow. It is significant, for example, that a large porportion of the black-spored forms grow upon dung, whilst the white-spored forms are found largely upon the ground, frequently in soil rich in humus, and the rusty-spored forms largely upon rotten wood, old stumps, etc. It would be instructive if careful records were made of spore-coloration in relation to the substratum as well as to light and shade.

X-RAYS AND FORAMINIFERA.

At a recent meeting of the Geological Society of London, a Demonstration on the Application of X-Rays to the Determination of the Interior Structure of Microscopic Fossils, particularly with reference to the Dimorphism of the Nummulites, was given by Mr. E. Heron-Allen, F.L.S., F.G.S., Pres.

R.M.S., and Mr. J. E. Barnard, F.R.M.S. Mr. Heron-Allen said that in the year 1826 Alcide d'Orbigny published among the innumerable, and for many years unidentified, nomina nuda that compose his ' Tableau Methodique de la Classe Cephalopodes' the name *Rotalia dubia.* This species was left untouched by Parker & Jones in their remarkable series of articles ' On the Nomenclature of the Foraminifera.' The French naturalist, G. Berthelin, was the first investigator to unearth and make use of the ' Planches inédites ' which had been partly completed by d'Orbigny for the illustration of his great work upon the Foraminifera, a work that was never published. Working with Parker and Jones's paper, Berthelin made for his own use careful tracings of 246 of A. d'Orbigny's unfinished outline-sketches. These sketches were never elaborated by d' Orbigny upon the ' Planches,' which are still preserved in the Laboratoire de Paléontologie under the care of Prof. Marcellin Boule ; among them was found the sketch of *Rotalia dubia.* On the death of Berthelin the tracings passed into the poessssion of Prof. Carlo Fornasini of Bologna, who reproduced them all in a valuable series of papers published between the years 1898 and 1908. Fornasini's opinion was that the organism depicted by d'Orbigny was doubtfully of Rhizopodal nature, and that it was probably referable to the Ostracoda. The speaker said that he had examined the d'Orbigny type-specimens in Paris in 1914, and had noted that *Rotalia dubia* was a worn and unidentified organism, resembling an Ostracod.

ROTALIA DUBIA.

There the matter rested until Mr. Arthur Earland and the speaker, while examining the material brought by Dr. J. J. Simpson from the Kerimba Archipelago (Portuguese East Africa) in 1915, discovered one or two undoubted Foraminifera of an unknown type, which resembled Berthelin's tracing. Prof. Boule kindly sent the d'Orbigny type-specimen to London, and the Rhizopodal nature of *Rotalia dubia* was established. It is not a *Rotalia*, and it must await determination until more specimens are obtained. It has been named provisionally *Pegedia papillata.* There were two or three forms of the organism, but only one perfect specimen of the d'Orbigny type ; and it was undesirable to risk destruction by cutting a section of it. In these circumstances Mr. Barnard was approached and he experimented with the object of ascertaining the interior structure of the shell by means of the X-rays. His results were extraordinarily promising, and led to further experiments.

SKIAGRAPHS OF FORAMINIFERA.

The speaker showed on the screen photographs of the common and dense Foraminifer *Massilina secans* (d'Orb.),

followed by a skiagraph of the same. A skiagraph of the still denser test of *Biloculina bulloides* d'Orb. shows the arrangement of the earlier chambers as clearly as it is indicated in Schlumberger's beautiful sections. The application of X-rays to the dense imperforate shells *Cornuspira foliacea* (Phillippi) produced skiagraphs showing the dimorphism of the shells, both megalo- and microspheric primordial chambers being clearly distinguishable. Such results led to the extension of the experiments to the agglutinated arenaceous forms, of which sections are made with extreme difficulty. The skiagraph of *Astrorhiza arenaria* Norman shows the internal cavities that contained the protoplasmic body. Two arenaceous forms, *Botellina labyrinthica* Brady and *Jaculella obtusa* Brady, that are almost identical in external appearance, are distinguished at once by their respective skiagraphs, the one exhibiting a simple tabular cavity, the other appearing labyrinthic.

NUMMULITES, ETC.

Mr. Barnard subsequently experimented on still more difficult material. The massive *Operculina complanata* Defrance, the umbilical portion of which is obscured by a mass of secondary shell-substance, furnished a clear skiagraph that showed some curious distortions of the internal septa. Similar results were obtained in the case of *Orbiculina adunca* (Fichtel & Moll), another species overladen with shell-matter. *Cyclammina cancellata* Brady is an arenaceous form, composed of softer mud and sand, studded with coarse sand-grains which make section-cutting almost an impossibility. The skiagraphs, however, reveal the primordial chamber, and establish the character of this form. The determination of the Nummulites, depending as it does on a knowledge of the internal structure of the test, is greatly facilitated by the application of X-rays, which removes the necessity of splitting it or cutting sections through it. The speaker showed ordinary photographs and skiagraphs, made at slightly varying azimuths, of *Nummulites lævigata* and *N. variolaria*, forms that strew the shores of Selsey Bill. A particularly notable result was obtained in the case of *N. gizehensis*, an organism that forms the dense masses of Nummulitic Limestone of which the Pyramids of Egypt and the Citadel at Cairo are built.

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The Journal of the Marine Biological Association, Vol. XI., No. 3, is quite up to the usual standard of the Journal we expect from this useful Society. It is well illustrated, E. W. Sexton's drawing on plate VII. being particularly pleasing. Besides the report of the Council, the Journal contains 'The Loss of the Eye-Pigment in *Gammarus chevreuxi*, a Mendelian Study,' by J. E. Allen and E. W. Sexton; 'Heredity in Plants, Animals, and Man,' 'Food from the Sea,' and 'The Age of Fishes and the Rate at which they grow,' all by J. E. Allen.

A FLORAL FILM OF 1831.

E. G. BAYFORD, F.E.S.
Annotated by F. A. Lees, M.R.C.S.

This picture of the flora of the Brampton and Wath area as set down in three lists in the *Village Magazine* or *Wath Repository* (of 1831) may add an item to the Bibliography of Yorkshire Botany. The serial referred to was issued in the years 1831, 1832 and 1833, when it came to an untimely end. Its editors were the Rev. Wm. Moorhouse and Larret Langley, of Brampton Academy, near Rotherham. F. A. Lees duly listed the work of Langley with that of the Rev. E. Wilson, of Swinton, in Loudon's *Mag. Nat. Hist.*, 1828 (Flo. W. Yks., 91), so this transcript from the Wath repository of local Indigenous Botany is supplementary thereto.

Nothing has been altered in the record as here given, save that in bringing the three papers into one list I have put the items into their linear arrangement more or less, and corrected obvious misprints such as ' Nitica ' into Urtica, etc.

Not being a botanist I cannot pretend to pass any criticism on the species named ; but I may be permitted to draw attention to the ' Green-man Orchis,' which, judging from the remarks in Flora W. Yorks. (p. 423)—' Hampole Wood,' by ' a Mrs. Broadrick ' (*sic*)—appears to call for further investigation. [Ay, and a clue, furnished in the place Brodsworth being near Hampole, and the fact that Watson does not seem to have seen a specimen.—F.A.L.]. Undoubtedly the district, and as a consequence its flora and fauna have materially altered in the eighty-odd years that have lapsed since 1831. A coleopterist myself, I have spent many years in studying the distribution in Yorkshire of our indigenous beetles ; and in the Wath area, as also in the Barnsley district, the gradual disappearance almost to extinction of the Glow-worm is a remarkable and indisputable fact. Although I have known both vicinities for over thirty years, I have never seen it in either ! yet at one time it was common all over the Wath area, Newhill, Brampton, etc. The late Henry Johnson [chemist, of Barnsley, who worked with and for me botanically in the Eighties.—F.A.L.] told me that the last specimen he saw at large was on his father's grave in the churchyard of Bolton-on-Dearne. The only place where it now survives is on the rail-bank near Conisboro', and it is uncommon there. Possibly similar or parallel reasons for this gradual dying-off may account for the disappearance of the orchid. [Well, yes, and of the dormouse, too, in many an even-still-sheltered site upon the warm magnesian limestone.—F.A.L.] unless, of course, a mistake in identification was made : whether this is possible or probable I do not know. [I cannot say decidedly

yet, though inclining towards *Aceras* having once really grown at Brodsworth, as it did in Leo Grindon's day at Gate-Burton Wood, near Gainsborough, in Lincoln ; because the Twayblade, the green perianthed *Listera*, appears *also* in the second of the Wath lists, the only other orchid likely to have been taken for it, as to flower, the leaves only patently unlike.—F.A.L.].

As for my list, column 1 gives the scientific, and column 2 the common, names, as given by G. P. N[icholson], the author of the record. Column 3 refers to the particular paper (of May 25th, July 26th or August 28th) in the Repository's pages. Column 4 the district locality from which the species derived.

A.D.=Adwick-on-Dearne (near). A.H.=Aldwarke Hall, near Rotherham. Ar.=Arlington. As.=Askern. A.S=Adwick-le-Street. Bram.=Brampton. Brod.=Brodsworth (nr. Hampole.—F.A.L.). C.b.=Bog near Conisbro' Castle. C.C.=Conisbro' Castle Walls. C.v.=Conisbro' village. D.=Denaby (near). H.R.=Hooton Roberts. R.=Rotherham. S.=Sprotboro'. W.D.=Wath-upon-Dearne (near).

Ranunculus aquatilis	Water crowfoot	1	W.D.
R. hederaceus	Ivy crowfoot	1	W.D.
R. sceleratus	Celery-leaved crowfoot	1	W.D.
R. flammula	Lesser spear wort	1	C.v.
Helleborus viridis	Green Hellebore	1	C.v.
Cardamine amara	Bitter lady's smock	1	C.b.
Turritis glabra	Tower wall-cress	1	W.D.
Lepidium campestre	Mithridate pepperwort	1	C.v.
Senebiera coronopus	Wart or Swine's Cress	2	W.D.
Spergula nodosa	Knotted spurrey	3	Ask.
Malva moschata	Marsh mallow	2	R.
Geranium pratense	Blue meadow crane's bill	2	R.
Genista tinctoria	Dyer's green weed	2	Bram.
Astragalus hypoglottis	Purple mount. milk vetch	3	Brod.
A. glycyphyllus	Sweet milk vetch	3	D.
Potentilla fruticosa	Shrubby cinquefoil	3	D.
Geum rivale	Water avens	1	A.H.
Lythrum salicaria	Spiked purple loosestrife	3	As.
Myriophyllum spicatum	Spiked water milfoil	3	W.D.
M. verticillatum	Whorled water milfoil	3	A.S.
Saxifraga tridactylites	Rue-leaved Saxifrage	1	C.v.
Hydrocotyle vulgaris	Sheep or white rot	3	Ask.
Cicuta virosa	Water hemlock, or cow-bane	3	Ask.*
Valeriana dioica	Small marsh red valerian	1	C.b.
V. officinalis	Great wild valerian	2	A.D.
Bidens tripartita	Trifid bur-marigold	2	S.
Campanula latifolia	Giant bell flower	2	Bram.
C. rapunculoides	Creeping bell flower	2	A.D.
Pyrola minor	Lesser winter-green	2	Bram.

* The one undoubted name-error in the list ; the plant that grew, and grows still, from Barnsley area to Askern is *Œnanthe crocata*, locally called 'Cowbane,' also because equally with the Water-Hemlock (a rare, declining species, now no longer existent in Yorkshire) it was poisonously acri-narcotic to cattle.—F.A.L.

Chlora perfoliata	Perfoliate yellow wort	2	S.
Convolvulus sepium	Great bind weed	3	W.D.
Hyoscyamus niger	Common henbane	3	D.
Veronica anagallis	Water speedwell	1	C.b.
Pedicularis palustris	Marsh louse-wort, or tall red rattle	2	C.v.
Orobanche major	Greater broom-rape	2	Bram.
Lamium amplexicaule	Henbit nettle	1	W.D.
Echium vulgare	Viper's bugloss	2	C.C.
Poterium sanguisorba	Common salad-burnet	2	C.C.
Lithospermum officinale	Grey mill or grey millet	1	C.v.
Symphytum officinale	Common comfrey	2	W.D.
Pinguicula vulgaris	Butterwort	1	C.b.
Utricularia vulgaris	Greater bladder-wort	2	A.S.
Hottonia palustris	Water violet or featherfoil	1	Ar.
Lysimachia vulgaris	Great yellow loosestrife	3	As.
L. nummularia	Creeping loosestrife money wort	3	As.
Anagallis caerulea	Blue pimpernel	2	W.D.
A. tenella	Bog pimpernel	3	C.v.
Polygonum amphibium	Amphibious persicaria	2	W.D.
P bistorta	Bistort or snake-weed	2	W D
Urtica urens	Small nettle	1	W.D.
Humulus lupulus	Common hop	3	W.D.
Triglochin palustre	Marsh arrow grass	2	W.D.
Sagittaria sagittaefolia	Arrow-head	2	W.D.
Aceras anthropophora	Green man orchis	3	Brod.
Orchis pyramidalis	Pyramidal orchis	2	S.
O. morio	Green winged orchis, with the dark purple, pale pink and milk white varieties	1	Bram.
O. mascula	Early orchis	1	W.D.
O. maculata	Spotted palmate orchis	1	W.D
O latifolia	March [? Marsh] orchis	1	W D'
O conopsea	Fragrant orchis	2	Bram
Habenaria viridis	Green habenaria or frog orchis	1	W D
H bifolia	Butterfly habenaria	1	W.D.
Ophrys muscifera	Fly orchis	1	W.D.
Neottia spiralis	Fragrant ladies' tresses	3	W.D.
Epipactis latifolia	Broad leaved helleborine	2	Bram.
Eriophorum angustifolium	Cotton grass	1	C.b.
Poa rigida	Hard meadow grass	3	Brod.
Aspidium thelypteris	Marsh shield fern	3	Ask.
Listera ovata	Common tway-blade	2	Bram
Parietaria officinalis	Pellitory of the wall	2	C.C.
Prunella vulgaris	All-heal, perfectly white	2	H.R.

Plants which have been gathered during the past month [*i.e.* I suppose May]. Wath, May 25, 1831.—G.P.N. Indigenous Botany [No. 1], p. 170. *Geum rivale* is added to this list as an editorial note.

Plants which have been gathered in flower during the past month [*i.e.* I suppose July]. Wath, July 26th, 1831. G.P.N. Indigenous Botany No. 2, pp. 241-2.

Plants which have been gathered in flower during the past month [*i.e.* I suppose August]. Wath, August 28, 1831.—G.P.N. Indigenous Botany No. 3, p. 276.

G. P. N[icholson.]

The Village Magazine or Wath Repository, Vol. I., 1831.

POSTSCRIPTUM. F. A. LEES. DECEMBER, 1917.

As regards the 'authority' for the names in the list, so fortuitously unearthed by Mr. Bayford, it must rest with G. P. Nicholson (a solicitor of Wath-upon-Dearne, who collected plants and preserved them) until we know whether the Rev. W. Moorhouse was a practical botanist or not. Langley was, and his few records and dried specimens extant, so far as I have ascertained so far, are all right, though he did not attain the reliable pioneer position of a Mr. S. Appleby—possibly his chances of wandering far afield were less—who contributed the rare Pore-grass or Land-weed of the pond-weed order, Scheuchzeria, from Thorne Moor, in 1832, to Nicholson's Herbarium. There were three examples of it—in flower—in that collection; a calf-bound, royal octavo affair, in several volumes. These came into the possession of the late S. Margerison, and in 1907 and 1908 I perfunctorily examined it; and S.M. gave one of the three specimens to Mr. J. F. Pickard and another to myself. What has become of this bound witness to the past I do not quite know, but it ought to be searched for *Aceras*, the 'green man,' etc. Many of the mounted plants had no indication of exact origin, but others had, as with Appleby's contributions. Perhaps the present owner will permit an expert examination to be now made of it, and so assuredly enhance its value. Then it might, *me judice*, and fitly enough, be presented to some Yorkshire Museum or Institution. In some small way this might form a fitting memorial to Margerison, just such a sort as would have rejoiced his cosmophil spirit.

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Cumberland Hemiptera-Heteroptera.—In addition to those recorded in *The Naturalist*, antea, p. 27-8, I have three species in my collection, taken last year, which do not seem to have been recorded before for this county. These are: *Scolopostethus grandis* Horv., one specimen only of this fine species being taken in April, on the banks of the Eden, below Grinsdale. *Poeciloscytus nigritus* Fall., not uncommon, but extremely local on a patch of White Bedstraw, growing in a hedge near Carleton. This pretty species scuttles off the beating sheet with a peculiar squirming motion, which I have also noticed in *P. gyllenhalii* Fall. *Atractotomus magnicornis* Fall., odd specimens by general sweeping at Orton and Ivegill, in August. *Orthotylus virens* Fall., may be mentioned here, one specimen on Alder near Spa Well (see *Entomologist's Monthly Magazine*, 1917, p. 251). I may also record *Berytus crassipes* H. S. from Anthorn in June, and *Salda orthochila* Fieb. from Orton in September. The additions have been kindly named or verified by Mr. E. A. Butler, F.E.S.—JAS. MURRAY, 2 Balfour Rd., Carlisle.

ROMANCE OF THE CUCKOO

E. P. BUTTERFIELD
Wilsden.

THE Cuckoo belongs to a family of birds which embraces seventeen genera, some of which are to be met with only in the tropical portion of the Old World, the Indo-Malayan sub-region, and the tropics of the New World, etc. There are three species of Cuckoo, in addition to our common species, which have visited the British Islands, viz. :—the Great Spotted Cuckoo, whose habitat is south-western and southern Europe, and an accidental visitant to the British Islands, and, like our common kind, is parasitic, placing its eggs in the nests of Magpies and Crows ; and the Yellow-billed and Black-billed Cuckoo, both American species—the former has occurred about ten times, the latter only once, in Ireland.

The Cuckoo (*Cuculus canorus*) is a summer visitant to the British Isles, where it is common, often abundant, especially in some years, and perhaps there is no other British bird with the same exactitude can be said to be so universally distributed as this species, being quite as much at home on the high and bleak moorland regions, wooded valleys, as well as the highly cultivated plains, and no other British bird has been so much talked and written about as the Cuckoo ; and still, with all the attention it has received from naturalists, our ignorance in many points of its life history is profound in the extreme. But in spite of this admission, it cannot be denied that the mythical element which, in former times, clung to the habits of this mysterious bird, has, and is being, eliminated by more exact observations.

The average date of arrival in this district (Wilsden) is about April 24th, but the date of arrival, like most migrants, is much influenced by the character of the season.

In 1879, it arrived on 22nd April ; 1882, not till May 4th which is a late date. It begins to lose its song here about the middle of June, and is usually silent the first or second week in July. One bird, however, I heard last year on Barden Moor, in Wharfedale, on July 5th, and was in full song. Most of the adult birds must leave here by the middle of July, but the young remain much later. A Cuckoo is recorded in " The Birds of Yorkshire," by one of my sons, as being killed on 5th November, 1902, at Horton, Bradford.

The well-known call-notes of the Cuckoo is said, by most naturalists, to be confined to the male bird, but I do not quite share this belief. A friend of mine informs me that he once wounded a Cuckoo by a gun-shot as it was flying near an old quarry, and was crying " cuckoo " at the time he shot, and on

picking up the Cuckoo it laid an egg in his hand. This opinion is borne out by a number of other naturalists which could be recorded if necessary.

The Cuckoo is the only bird in Britain which habitaully lays its egg in the nests of other birds. Its egg has been found in the nests of about 120 species of European birds, nearly a hundred of which have been found in the nests of British birds. The Titlark is the species in this district which the cuckoo usually victimises. Other species are occasionally selected, such as Whinchat, Tree Pipit, Twite, Ring Ouzel, Skylark, and Hedge Sparrow. The eggs found in this district are nearly all of one type, which approximate in size and colouration to the Skylark, differing in usually being less broadly ovate, and not so polished in appearance. Only two variations from the type have been found by me, and these were striking; one found in the nest of a Titlark containing a light variety, somewhat after the pattern of a Pied Wagtail. In this nest two eggs of the Cuckoo were found, which closely assimmilated to those of the Wagtail. Two years ago I found an egg of the Cuckoo in the nest of a Hedge Sparrow, in Cottingley Wood, which was quite blue. I feel quite certain that the egg in question was the egg of a Cuckoo, since it was exactly similar in shape, size and texture, and differed altogether from the shape of the eggs in the nest of the Hedge Sparrow. I gave it to my son Rosse, who has it at present in the Keighley Museum.

The egg of the Cuckoo is usually deposited in the nest of its dupe before it commences to sit, frequently, I have found, when about the third egg has been laid, and I have never yet known a case where the Cuckoo's egg has been introduced without an egg of its dupe having been abstracted. Sometimes it lays in empty nests—even deserted nests—and sometimes in nests before completion. One correspondent writes that he found twelve eggs of the Cuckoo within the radius of a quarter of a mile, nine of which, he believed, were laid by two birds (two eggs in one nest), and five of the eggs were found in deserted nests of the Titlark; and another writer in *The Countryside* for May 19th, 1906, states that every Cuckoo egg which he has found has been laid before any of the rightful occupant's eggs have been laid.

Still another writer, Mr. Shirley Slocombe, in *The Countryside* for September 1st, 1906, states that in seven years he has found no fewer than six Cuckoo's eggs in empty nests, two of which were placed in the nests of the Reed Warbler, the others in the nests of the Hedge Sparrow, Meadow Pipit, Pied Wagtail and Red-backed Shrike, and what is more remarkable, he further says that the colouration of the Cuckoo's egg, in every instance, ' was designed to match those of the owners of the respective

Naturalist,

nests, whose eggs were deposited afterwards.' The Cuckoo's egg found in the Hedge Sparrow's nest above mentioned, the writer thinks, is the nearest approach to a blue Cuckoo's egg as yet found in this country, having a pale blue ground with only eleven fine freckles. The Cuckoo is sometimes accused of not only robbing one egg, but the whole clutch, after which it has been known to deposit its own egg, but such instances are rare.

Does the Cuckoo eat birds' eggs or is it a popular legend? I have little hesitation in answering this question in the affirmative, although it is stoutly denied by some naturalists, and even eminent naturalists. Evidence incriminating the Cuckoo of this propensity may be quoted from a brochure by J. H. Gurney, in which a Mr. Wilson states that in the spring of 1880 at Porick near Worcester, he actually took the remains of eggs, which he judged to be those of a Robin and Hedge Sparrow, out of the crop of a Cuckoo, and further evidence is given in Booth's rough notes, volume I., on the cuckoo. I should not, however, like it to be inferred that I am accusing the cuckoo—male and female—of sucking birds' eggs in any wholesale or indiscriminate sense, this propensity may be chiefly confined to the female at the time of the introduction of its egg into its dupe's nest.

The Cuckoo lays its egg in a much greater variety of nests in the south than in the north of Britain, and the egg is much more variable. As I have already stated, the type of egg here is fairly constant, and it could be easily overlooked if placed in the nest of a Skylark. Indeed, I have often wondered why the egg is not oftener placed in the nest of this species, as it is so very abundant and there would be no difficulty for the cuckoo to find suitable nests in which to deposit its egg during its stay in this district; yet I have never found but one egg in the nest of the lark for over forty years; and this nest was found on a heathy waste where the titlark was in some abundance. The cuckoo's egg has been found three times in the nest of the Ring Ouzel within a radius of seven miles from Wilsden. As we get further away from the Pennine Range, the Cuckoo deposits its egg in a greater variety of nests from what it does in this part of Yorkshire.

The Rev. Julian Tuck writes me that in Suffolk the Hedge Sparrow is the species which is oftenest victimised by the Cuckoo, but he has found its egg in the nests of Thrush, Robin, Blackcap, Whitethroat, Greenfinch, Reed Bunting, Sedge Warbler, Pied Wagtail; in addition he has been shown the nests of Nightingale, Spotted Flycatcher and Tree Pipit, containing eggs of the Cuckoo. Thrice has he known the egg in the nest of Titlark—once one of this species contained two eggs of the Cuckoo. One of the most unlikely dupes of the

Cuckoo is the Hawfinch, recorded in *The Zoologist*, Vol. VI., p. 279, 4th series, in which Mr. Palmer records the finding of three nests in the neighbourhood of Ludlow, which contained the egg of the Cuckoo. In recording these occurrences he states that for upwards of thirty years' active field-work he had never previously found a Cuckoo's egg in the nest of Hawfinch. In some parts of Norfolk the Reed Warbler seems to be chosen very frequently as fosterer, yet Rev. J. Tuck, in *The Zoologist*, Vol. XIII., p. 317, states thirty nests of this species had been found within three years in Suffolk, but not one nest had been used by the Cuckoo. About Pentland Hills the Titlark is the commonest fosterer (see *The Zoologist*, Vol. XI., page 13), and what applies to this district, I presume, will apply to Scotland generally, and probably to the whole of Britain north of Yorkshire, but of this I cannot speak with certainty. In the Wandsworth district (see *The Zoologist*, Vol. XI., page 430) Mr. White has found the eggs of the Cuckoo all in Sedge Warblers' nests, and absolutely identical for four successive years (1903-6), evidently the produce of one bird, from which it may be inferred that the Cuckoo returns annually to the same locality for breeding purposes. Indeed, it is only on this supposttion that many peculiarities in its economy can be explained. I have known of one Cuckoo in this district which returned for two, if not three, years in succession. It is hardly possible I could have been mistaken, as this bird's notes were so very much different from the ordinary call-notes of this species. In the North Finchley district the Pied Wagtail seems to be the favourite dupe, the Cuckoo's egg being of the grey-blue type, and it is said the Cuckoo's egg is not found in the nest of any other species (see *Country Queries and Notes*, 1908, page 175).

Sometimes the Cuckoo lays its egg in the nest of its dupe whose eggs have been incubated some time, and one is recorded by Mr. Forrest in his 'Fauna of North Wales' as having been found by Mr. Devonport in the Isle of Arran, in the nest of a Titlark, and contained only one egg of the rightful owner, hard sat when the Cuckoo's egg was deposited, and Mr. Porritt mentions having once found a Cuckoo's egg by itself in a slight hollow on Thorne Waste which was also partly incubated. Darwin, in his 'Origin of Species,' page 213, gives a similar case, on the authority of Adolf Muller, and remarks:—'This rare event is probably a case of reversion to the long-lost aboriginal instinct of nidification.'

It used to be thought that the Cuckoo laid but one egg in a season; now, however, the number is variously estimated from seven to nearly three times this number—perhaps ten will be nearer the average in a season.

(To be continued).

YORKSHIRE ENTOMOLOGY IN 1917.

B. MORLEY.

THE Annual Meeting of the Entomological Section of the Yorkshire Naturalists' Union was held in the Institute, Leeds, on October 27th, 1917, under the presidency of Mr. W. P. Winter, B.Sc.

Reports which the various committees had supplied for the annual meeting of the Union were read and passed. Exhibits were numerous. Capt. H. D. Smart showed a specimen of *Sphinx cassinea* taken in Escrick Park, York, on October 26th, 1917. Two fine variations of *Arctia caia* and varieties of extreme light and dark forms of *Abraxas grossulariata* ab. *nigro-sparsata*, by Mr. Alfred Kaye, Huddersfield, West Riding; *Polia chi*, *Xanthia citrago*, *Tephrosia biundularia* and *Spilosoma fuliginosa*, by Mr. J. Hooper, Middlestown; *Stigmonota nitidana* and *Choreutes scintillulana* from Doncaster, and specimens of *Papilio machaon*, *Colias hyale* and *C. edusa* var. *helice* from the Somme front, by Dr. H. H. Corbett. A large case of New Zealand lepidoptera, including many fine species, by Mr. W. Hewett. Mr. B. Morley showed series of *Pædisca solandriana*, *Tortrix corylana* and *Scoparia ambigualis*, each showing extensive colour variation, and a specimen of *Eriopsela fractifasciana*, the last being new to Yorkshire.

COLEOPTERA.—Dr. W. J. Fordham included in his exhibits a black form of *Pterostichus versicolor* and several species new to V.C's. 61 and 64. *Atheta britteni* and *Gabrius stipes* new to the county, and a series of colour varieties of *Donacia sericea*.

Mr. M. L. Thompson showed, amongst other species, *Amara rufocincta*, *Bembidium lunatum*, *Cymindis raporariorum*, *Bolitochara lunulata*, *Bythinus burrelli* and *Rhinomacea attelaboides* from North Yorkshire, and also *Atheta nitidula* from both Cleveland and Swaledale, new to the county, and an imported species *Speimophagus pictoralis* from Middlesbrough.

Mr. E. C. Horrell had a specimen of *Lissodana ansor*, a rare British species, new to the county, taken by Mr. J. Digby Firth.

Dr. Corbett showed the following species of dragon-flies from the Doncaster district:—*Libellula quadrimaculata* L., *L. fulva* Müll., *Sympetrum striolatum* Charp., *S. scoticum* Don., *Brachytron pratense* Müll., *Aeschna juncea* L., *Ae. cyanea* Müll., *Ae. grandis* L., *Lestes sponsa* Hans., *Enallagma cyathigerum* Charp., *Agrion puella* L., *Pyrrhosoma minium* Harris, *Ischnura elegans* Linden.

Mr. Rosse Butterfield exhibited on behalf of Mr. Musham a number of Aculeate Hymenoptera collected by him in his garden at Selby during the summer. Among these were *Anthophora pilipes*, *Prosopis communis*, *Colletes daviesana*.

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Megachile centuncularis, *Odynerus pictus* and *Crabro leucostoma* and some widely distributed Andrenidi and Halictix. With regard to the four first mentioned species, which were apparently common in Mr. Musham's garden, he mentioned that among the Yorkshire hills to the West and North West these are very rare or not recorded.

Mr. Butterfield also exhibited all the British species of social wasps, and remarked that all occur in Yorkshire with the exception of the hornet. The parasite or inquiline, *Vespa austriaca* Panz., was apparently rare, but its distribution was not fully known.

The following noteworthy additions were made to the report on lepidoptera :—*Sphinx convolvuli* ♂ Malton, September 23rd, 1917 ; another from Todmorden in the same month. One specimen at Dunnington, near York ; four obtained at York and one at Middleton, near Pickering ; several at Doncaster. Also in September *Vanessa antiopa* seen near Pickering on August 7th by Mr. J. W. Stancliffe.

Vanessa io, which of late years had become very scarce, has occurred practically all over the country. *Plusia moneta*, a specimen captured in July by Mr. Willoughby Fabian in his garden at York. Mr. Arthur Smith, of York, reports *Collix sparsata* very common at Askham Bog and a specimen of *Sesia culiciformis* at Warthill, near York, July 27th, 1917.

Mr. J. Hooper reported the great destruction of acres of white turnips by the larvæ of *Agrotis segetum* at Middlestown, near Wakefield. The dead roots were generally attacked by four or five caterpillars, upon which large flocks of starlings fed daily during September and October.

In 1916, Mr. Ashton Lofthouse reported *Mixodia ratzeburghiana* from Middlesbrough, and *Argyresthia dilectella* occurred freely about juniper at Linthorpe at the end of July. These species have only one previous Yorkshire record.

Mr. B. Morley read a lengthy report on the exceptional abundance of many species occurring in the south-western area of the county.

At the evening meeting, Mr. Winter gave an interesting address on the silk-spinning habits of spiders. Many forms of webs were described, the configuration of characteristic forms were shown by lantern slides ; various peculiarities were explained by means of experiments.

A discussion followed the conclusion of Mr. Winter's address.

The work done in the county during the past season is distinctly encouraging, and the unanimous opinion of all the committees of the section is that entomological science has advanced appreciably in spite of restrictions and other depressing circumstances.

YORKSHIRE COLEOPTERA IN 1917.

W. J. FORDHAM, M.R.C.S., L.R.C.P., F.E.S.,
Bubwith.

In the preliminary note for publication with the Annual Report of the Y.N.U., it was stated that the list of new species was not great. Since this was written many fresh records have come to hand and the following list includes eleven additions to the county list and the confirmation of a doubtful record, together with an imported species at Middlesbrough. Of these additions perhaps the most interesting to Yorkshire coleopterists is *Lissodema cursor* Gyll., which was added to the British list under the name of *L. heyanum* Redt., on specimens taken in Derbyshire by the late Archdeacon Hey. There are many new vice-comital records—14 for V.C. 61, 3 for V.C. 62, 12 for V.C. 63, 36 for V.C. 64 and 1 for V.C. 65. The large number added to V.C. 64 is incorporated through the kindness of Mr. E. C. Horrell, who has permitted me to extract them from the record book of the Leeds Naturalists' Club. Following a severe winter the past season has been marked by an abundance of beetles, though the writer has found that their duration has been shorter than usual. Mr. M. L. Thompson notes that certain species have occurred this year which are somewhat irregular in their appearance, sometimes several years elapsing between their advent, for some reason at present obscure and inexplicable.

Mr. E. G. Bayford remarks that *Pterostichus madidus* and *Ocypus olens* are increasingly common in the Barnsley district, and communicates the following interesting observation :— ' On Whit-Tuesday I was in Wentworth Park and for quite a long time watched a specimen of *P. madidus* busy destroying a species of *Andrena* which had numerous burrows in the hard footpath. Its habit was to wait until the bee had gone into its burrow, when it followed, and I suppose there was a tragedy as I did not excavate the burrow to make sure. The beetle went to work in a very business-like manner.'

The breeding out of *Aleochara bilineata* Gyll. by Mr. Parkin, of Wakefield, from the pupa cases of the Cabbage Fly, confirms Mr. Wadsworth's researches.* The beetle larva penetrates the puparium and feeds on the enclosed pupa of the fly. Very little has been published during the year relating to Yorkshire Coleoptera, but a note on additional Coleoptera in 1916 (which contains three new county records) in *The Naturalist*, 1917, p. 160, should be not be overlooked. As in former years, the members of the committee are much indebted to Messrs. E. A. Newbery, W. E. Sharp and J. R. le-B. Tomlin for help in the

* *Journ. Econ. Biol.*, 1915, June, pp. 1-27.

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determination of species. The dagger and asterisk refer, as usual, to new county and vice-county additions respectively.

The initials indicate Dr. H. H. Corbett, Messrs. E. G. Bayford, J. W. Carter, J. D. Firth, E. C. Horrell, M. L. Thompson, G. B. Walsh, and the writer. Records are also given in the list for which we are indebted to Messrs. W. Falconer, A. A. Fordham, C. W. Horrell, S. Matthewman, G. Parkin, C. W. Pybus and A. E. Thornes.

Carabus catenulatus Scop. Black var. Slope of Mickle Fell, Upper Teesdale. September. M. L. T.

Bembidion lunatum Duft. Abundant on muddy banks of Tees estuary at Middlesbrough. M. L. T. *62.

Bembidion rupestre L. (*bruxellense* Wesm.) On high moor, head of Farndale, Cleveland. May. M. L. T.

Bembidion saxatile Gyll. The northern type form occurs on the coast at Saltburn. M. L. T.

Ophonus rufibarbis F. Armley. A. E. Thornes, 4-17. Collingham. E. C. H. 6-16.

Amara prætermissa Sahl. (*rufocincta* Dj.). Eston, a few under stones. M. L. T.

Amara lunicollis Schiöd. Adel. J. D. F. 5-15.

Pterostichus cærulescens L. (*versicolor* Stm.). Skipwith Common, 5-17. An almost black form. W. J. F.

Pterostichus macer Marsh. (*picimanus* Duft). Aughton, 3-17. One in earth on a large mole-hill. W. J. F.

Synuchus (*Taphria*) *nivalis* Pz. Upsal, near Middlesbrough, 7-17. W. J. F.

Agonum gracile Gyll. Abundant in tufts and wet sphagnum on Skipwith Common, 5-17. W. J. F.
Adel Dam, 8-16. J. D. F. *64.

Agonum thoreyi Dj. var. *puella* Dj. Harewood, 4-15. J. D. F. *64.

Cymindis vaporariorum L. On moor at Commondale. June. M. L. T.

Ilybius fenestratus F. Meanwood, 8-16. J. D. F. *64.

Orectochilus villosus Müll. One crawling on mud in dried-up ditch. North Duffield Ings, 6-17. W. J. F. *61.

Cercyon lateralis Marsh. Adel. C. W. Pybus, 6-16. Boston Spa, 5-15. J. D. F. *64.

Cercyon ustulatus Preysl. (*hæmorrhous* Gyll.). Bubwith flood refuse, 12-16. W. J. F. *61.

Aleochara bilineata Gyll. Wakefield, preying on *Chortophila brassicæ* Bouché, 9-17. The beetle larva enters the puparium of the fly. G. Parkin. *63 (See *Journ. Econ. Biol.*, 1915, June. 1-27).

†*Atheta nitidula* Gr. Keld, Upper Swaledale in 1915, and moss on high moor at Kildale, Cleveland, 1916. Both localities at 1200 feet. (A northern species). M. L. T.

Atheta tibialis Heer. A mountain species. Mickle Fell. September. M. L. T.

†*Atheta britteni* Joy. Bubwith, in flood refuse. W. J. F. (See *Nat.*, 1917, p. 207).

†*Bolitochara lunulata* Pk. One in a rotten branch in a moorland wood. Kildale. July. M. L. T. (This species was recorded from Yorkshire by Stephens in his 'Manual,' but no locality was given).

Tachinus laticollis Gr. Adel. C. W. Horrell, 4-17. Boston Spa, 4-15. J. D. F. *64.

Bryocharis cingulata Mann. Morton Wood, Hepworth. W. Falconer.

Mycetoporus rufescens Steph. (*lucidus* Er.). In moss, Moorland Wood, Kildale. July. M. L. T. *62.

Quedius auricomus Kies. Buckden Ghyll, in wet moss, 9-17. W. J. F. *64.

Quedius umbrinus Er. Buckden Ghyll, in wet moss, 9-17. W. J. F.

Quedius scintillans Gr. Bubwith, 6-15. W. J. F. *61.

Quedius longicornis Kr. In mole's nest, Aughton, 3-17. W. J. F.

Quedius picipes Mann. Ellen Springs, Shipley, 7-17. W. Falconer. *63. Collingham, 5-17. C. W. Horrell. *64.

Quedius semiæneus Steph. Harrogate, 9-16. C. W. Pybus. *64.

Philonthus chalceus Steph. (*proximus* Kr.). Adel. J. D. F., 4-17. *64.

†*Gabrius appendiculatus* Sharp. Bubwith, flood refuse, 1910-5-16. G. B. Walsh.

Gabrius nigritulus Gr. Nunthorpe, 9-15. W. J. F.

†*Gabrius stipes* Sharp. Skipwith Common, 5-17. Buckden, 9-17. W. J. F.

Stenus flavipes Steph. Adel Dam, 5-17. C. W. Horrell. *64.

Oxyporus rufus L. Martin Beck Wood, near Bawtrey. H. H. C.

Bledius pallipes Gr. Walshford Bridge, 5-17. J. D. F. *64.

Trogophlœus elongatulus Er. Bubwith, flood refuse, 12-16. W. J. F. *61.

Lesteva heeri Fauv. (*sicula* Brit. Cat.). Morton Wood, Hepworth. W. Falconer.

Lathrimeum unicolor Steph. Ainley Place, 3-17. W. Falconer. *63.

Phyllocrepa vilis Er. Kildale, on mountain ash. June. M. L. T. *62.

Proteinus ovalis Steph. Adel, 4-17. J. D. F. Collingham, 6-16. E. C. H. Boston Spa, 4-15. E. C. H. *64.

Megarthrus sinuatocollis Lac. Roundhay Park, 6-16. J. D. F. *64.

Bythinus burrelli Den. Moss in moorland Wood, Kildale. One. July. M. L. T.

Scydmænus tarsatus Müll. Adel, 4-17. C. W. Horrell. Bardsey, 5-17. J. D. F. *64.

Catops fumatus Spence. Collingham, 6-16. E. C. H. *64. Martin Beck Wood, in dead hedgehog. H. H. C.

Catops kirbyi Spence. Dead hedgehog, Martin Beck Wood. H. H. C.

Catops watsoni Spence. Dead hedgehog, Martin Beck Wood. H. H. C. *63.

Clambus armadillo De G. Bubwith, flood refuse, 12-16. W. J. F. *61.

†*Ptenidium fuscicorne* Er. Adel, 4-17. C. W. Horrell.

†*Trichopteryx intermedia* Gill (*lata* Matth.). Two specimens in a mouse's nest at Middlesbrough. Sept. M. L. T.

Byturus fumatus F. (*sambuci*, Brit. Cat.). Collingham, 5-16. J. D. F. Boston Spa, 6-17. J. D. F. *64.

Carpophilus hemipterus L. Leeds, 5-17, in dried fruits E. C. H. *64.

Glischrochilus (*Ips*) *olivieri* Bed. (4 *punctata* Hbst.). Skipwith, 5-17. W. J. F. Escrick, 5-17. W. J. F.

Rhizophagus perforatus Er. Howden, 5-17. W. J. F. *61.

Cryptophagus pubescens Stm. Morton Wood, Hepworth. W. Falconer. *63.

Atomaria ruficornis Marsh. Wilberlee, Slaithwaite, 6-17. W. Falconer. *63.

Ephistemus globulus Pk. (*gyrinoides* Marsh). Collingham, 6-16. E. C. H. *64.

Lathridius bergrothi Reitt. In cellar, Leeds. S. Matthewman, 5-17. *64.

Mycetophagus piceus F. Tankersley. One, 8-17. E. G. B. *63.

Heterocerus marginatus F. Walshford Bridge, 5-17. J. D. F. *64.

Aphodius hæmorrhoidalis L. Collingham, 6-16. E. C. H. *64.

Aphodius granarius L. Adel, 4-17. C. W. Horrell. Arthington, 3-17, C. W. H. *64.

Anomala ænea De G. (*frischi* F.). Numerous on July 6th, 1917, flying in sun at Warrenby, Teesmouth. A. A. Fordham. (None found on July 7th, 1917, W. J. F. and M. L. T., and not observed by A. A. F. since. The 6th was a warm sunny day, the 7th was fine but windy.)

Corymbites pectinicornis L. Breighton, 6-17. W. J. F. *61.

Selatosomus æneus L. Burley Head, Wharfedale, 8-17. W. J. F.

Limonius æruginosus Ol. (*cylindricus* Pk.). Thorganby, 6-17. W. J. F. *61. (The record in the 1912 report was an error—the insect there recorded was *Corymbites metallicus*, noted in a subsequent report from Bubwith.)

(*To be continued*).

AN ADDITION TO THE BRITISH LICHEN-FLORA.

Rev. W. JOHNSON.

It was my good fortune to discover recently an interesting addition to our British Lichen-Flora.

I have beside me considerable lichen-material gathered years ago. I have recently turned my attention to this material, and in a gathering from St. Bees, Cumberland, I found on examination, what turned out to be not only a new lichen to Great Britain, but a new genus also, which is that of *Sarcopyrenia* Nyl. This genus only contains one species which is named *Sarcopyrenia gibba* Nyl. It is a very distinct and interesting lichen, having a sort of double clavate sporidia, unlike the sporidia of any previous British species.

Dr. Nylander records this lichen as previously found in Algiers, Switzerland and Germany. It grows on arenaceous and limestone rocks. In growth, my specimens are associated with *Lecanora vitellina* Ach., the yellow, squamulose, thallus, of which must not be confused with that of *Sarcopyrenia*. I found this new lichen on the shore rocks St. Bees, and on the Whitehaven side of those rocks from the entrance from St. Bees Village. The rocks were large and flat, and almost on the sand level.

I sent a specimen of this lichen to the British Museum, where Miss A. L. Smith, F.L.S., confirmed my discovery, a notice of which will appear in her new volume.

I may also say that I purpose including this new lichen in the 13th Fasciculus of my 'North of England Lichen-Herbarium,' which is now only awaiting the issue of Miss Smith's final volume.

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Water-Vole and Hedgehog. — Recently, a friend of mine, while walking along by a small stream in Surrey, saw, a short distance ahead, a full grown water-vole pulling some heavy object across his path. On reaching the spot this proved to be the carcase of a nearly full-grown hedgehog. The vole had hold of the hedgehog by the throat, and was about to cross the stream with it. No doubt the hedgehog had been dead for some hours, and had probably been found in that condition by the vole.—L. B. Langmead, Forest Hill, Jan. 18th, 1918.

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The Journal of the Board of Agriculture for January contains an illustrated article on Cheese Mites.

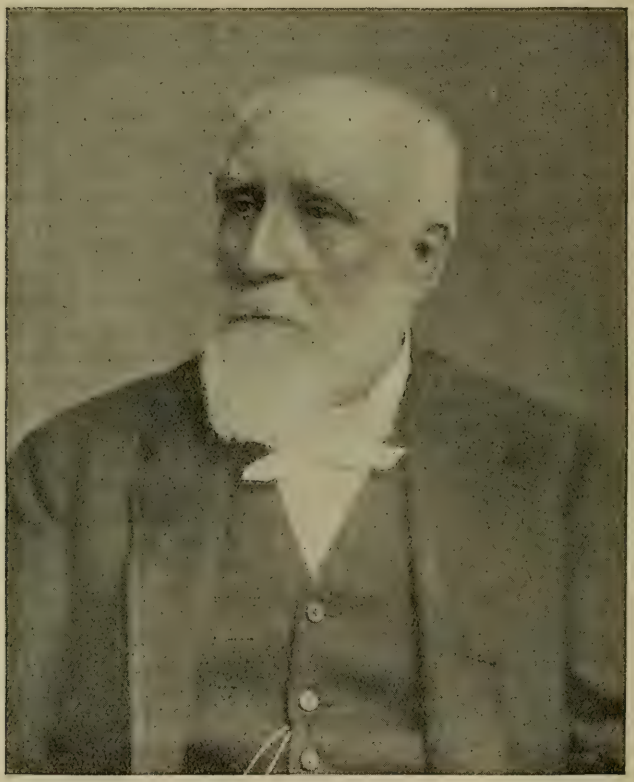
We understand that Mrs. Leo Grindon has offered £2,000 for the provision and upkeep of a meeting and lecture room in the future new Manchester Free Reference Library for the use of the different Scientific Societies in the city.

In Memoriam.

WILLIAM GREENWELL, D.C.L., F.R.S., F.S.A.

1820–1918.

THE name of ' Canon Greenwell ' has been almost a household word among naturalists and antiquaries in the north of England for more than half a century, and by his writings and collections



he was known much further afield. His death occurred towards the end of January, when he was in his 98th year. He was perhaps best known by his ' British Barrows,' a volume published in 1877, when the craze for ' barrow-digging ' was at its height. The volume contained particulars of the excavation of 234 mounds, mostly in the north of England. In 1890 he contributed an account of other 61 barrows to *Archæologia*, and in the same journal for 1906 he wrote a valuable paper on ' Early Iron Age Burials in Yorkshire.'

'The Canon,' as he was popularly known, was a collector of extraordinary ability; and what with purse and remarkable powers of persuasion, his contemporaries had little chance of success if he was in the field.

While, unquestionably, archæological science owes much to his researches; and while a large number of specimens were preserved by his labours which otherwise might never have been known, and while, of course, he had the right of disposing of his collections in the way he considered best, it must be admitted that his method was at times a little disconcerting to students. For instance, we believe his collections from the barrows, mostly in Yorkshire, were disposed of in different ways. The pottery he presented to the British Museum, where, as the 'Greenwell Collection' it is well known; Dr. Sturge, then in Nice, bought his stone implements for £1,200; the human skulls were given to Oxford, but the bronze and gold implements he kept at Durham till 1908, when they were sold to Mr. Pierpont Morgan, who, fortunately for British antiquaries, placed them in the British Museum. We must admit that the method adopted by a fellow member in the same field, the late J. R. Mortimer, of keeping all the remains from a particular barrow together, commends itself to us.

In 1856 Canon Greenwell travelled extensively in Greece, and afterwards formed an unusually large and valuable collection of ancient Greek coins. This was eventually sold to a Sussex gentleman, and is now in Boston, U.S.A.

So long ago as 1846, he helped to promote the Tyneside Naturalists' Field Club, one of our earliest natural history societies. In 1862, he joined the council of the Durham Archæological Society, then recently established. He was elected President in 1865, and we believe he held that office every subsequent year until his death. He took a keen interest in the Cathedral at Durham, particularly with regard to the library, etc.; and it is largely due to his zeal that many acts of vandalism were prevented. He contributed some valuable volumes to the Surtees Society's publications, and in many ways has made his busy life 'worth while.' This is all the more remarkable when it is borne in mind that he was forty before he took any real interest in prehistoric antiquities.

To anglers, Canon Greenwell was well known—over half a century ago he 'invented' an artificial fly, 'Greenwell's Glory,' which is known to all fly-fishermen. He also was responsible for a salmon-fly which bears his name.

Though delicate in his youth, Canon Greenwell attained an age rarely reached in these times. He retained all his faculties to the end—even during 1917 devoting several days to his favourite pastime of angling.

Canon Greenwell is almost the last in the list of our giants

in British prehistoric archæology—Lyell, Pitt-Rivers, Avebury, Evans, Mortimer, have all gone—and we look in vain for similar men to take their places.

Years ago, I received much help and encouragement at the hands of Canon Greenwell, and was often invited to visit him at Durham, where drawer after drawer of heavy bronze implements were displayed and examined. He also gave me the great privilege of figuring and describing some of his East Yorkshire specimens. The photograph reproduced herewith was given to me at that time, and represents Canon Greenwell in the prime of his life.—T.S.

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W. A. PARKER, F.G.S., 1855-1918.

We much regret to read the announcement of the death of W. A. Parker, the Rochdale Schoolmaster, at the age of 63. He was principally known among naturalists for the excellent work he did in connection with the fossils contained in the ironstone nodules of the Middle Coal Measures at Sparth, Rochdale. With other helpers he brought to light an interesting number of Orthopterous insects, Arachnida and Crustacea, many of which have been figured and described in *The Geological Magazine* by Dr. Henry Woodward. A new Crustacean, *Rochdaleia parkeri*, was named after him. Many of the specimens he collected are preserved in the Natural History Museum, South Kensington, and in the Manchester Museum, and a small series is to be seen in the Museum at Hull.—T.S.

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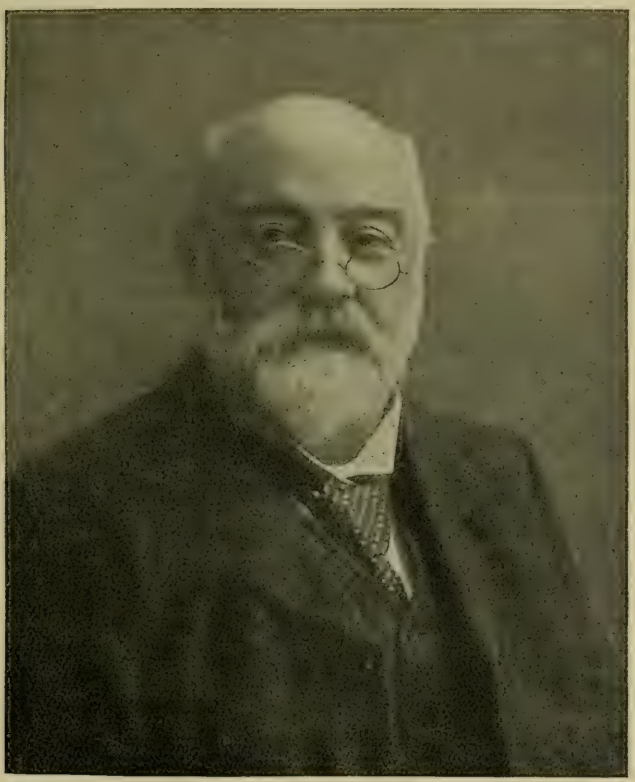
GEORGE ALEXANDER LOUIS LEBOUR, M.A., D.Sc., F.G.S.

We much regret to record the death of Prof. Lebour, which took place at Corbridge-on-Tyne recently, the Professor being in his 71st year.

Prof. Lebour's work, particularly in Northumberland and Durham, is well known. He was the author of a useful book on the 'Geology of Northumberland and Durham,' three editions of which appeared between 1873 and 1879. He published a 'Geological Map of Northumberland' in 1877, wrote 'The Geology of Durham' in the *Victoria History*, and has contributed over 100 papers on geological subjects to various magazines. These have principally dealt with Carboniferous Geology, but he was particularly interested in the relation of geology to public health, and made many valuable contributions thereon. At the Newcastle meeting of the British Association in 1916, he was the President of the Corresponding Societies' Committee, and delivered an interesting address dealing with 'Co-operation among Field Clubs,' which was

noticed in this Journal at the time (see *The Naturalist* for October, 1916, pp. 318-321).

Prof. Lebour always deplored the disappearance of the old-fashioned 'all-round' type of naturalist, and he promised our readers a paper on the subject, but unfortunately this has not been received. As a teacher of Geology, Prof. Lebour was eminently successful, and had a charming way of interesting



his students in the science; possibly his work in this way, though indirect, has been far more beneficial to geological science then has his published works, valuable though they are. He was the vice-principal of Armstrong College since 1902, was appointed Prof. of Geology in 1879, having been lecturer in Geological Surveying for six years previously. In 1903 he was awarded the Murchison Medal of the Geological Society of London.

He leaves a widow and two daughters, to whom we extend every sympathy.—T. S.

MATTHEW B. SLATER, F.L.S.

A still further gap in the ranks of prominent Yorkshire naturalists occurred on the eve of our going to press, in the death of Matthew B. Slater, of Malton, at the age of 88. Mr. Slater was one of the original members of the Yorkshire Naturalists' Union, and in the old days was a familiar figure at the Union's meetings and excursions, as well as at the

annual conferences of the British Association, where, together with our ex-President, Mr. W. N. Cheesman, and the late William West, the present writer had many pleasant meetings.

Mr. Slater has occupied various positions in the Botanical section of the Union, and some years ago was offered the Presidency, which he declined on the ground of advancing years. He was particularly interested in mosses and hepatics, of which he made an extensive collection, and he contributed notes thereon to *The Naturalist* as long ago as 1880.

For the second edition of Baker's 'North Yorkshire,' Mr. Slater undertook the preparation of the section devoted to mosses and hepatics, in connection with which I paid many pleasant visits to his home at Newbiggin, Malton. That work was issued in 1906 and occupied the whole of part 33—nearly 300 pages—of the Union's Transactions. It not only contained particulars of the distribution of 418 mosses (over a hundred more than were given in the first edition of 1863), but a list of over 120 hepatics—almost entirely new. Mr. Slater also recorded many new localities, and considerably added to the value of his work by preparing an extensive account of the literature of the subject.

Mr. Slater took a prominent part in founding the Malton Naturalists' Society in 1880, and ever since has taken much interest in the society's work, has held various offices in connection with it, given lectures, and materially assisted in the formation and arrangement of its museum. In recent years his health prevented him from carrying out his work. His death is a serious loss to Yorkshire science, and the naturalists at Malton will have difficulty in finding any one to take his place.—T. S.

——: o :——

The Journal of the Institution of Petroleum Technologists (Vol. IV. No. 13), among many other papers, contains one 'On the Oil Prospects of the British Isles,' by W. H. Dalton, F.G.S., the Society's Editor and Librarian.

An order has been made suspending, until the 1st day of June next, the Wild Birds Protection (East Riding of Yorkshire) Order of the n22d February, 1916, in so far as it prohibits the taking or destroying of the eggs of the blackheaded gull.

The *Manchester Museum Publication* No. 80, is a reprint of Mr. Herbert Bolton's paper on the 'Mark Stirrup' Collection of Fossil Insects from the Coal Measures of Central France. No. 81 is the Museum's *Annual Report for* 1916-17, and contains an excellent record of the useful work accomplished in that institution.

No. 24 of *The Journal and Transactions of the Leeds Astronomical Society*, edited by Chas. T. Whitmell, was published in January (102 pp., 2s. 6d.). It contains an enormous number of astronomical notes by the various members of the Society, as well as an appreciation of Sir William Herschel by Miss C. A. Barbour. Various contributions to other journals are here reprinted, so that the Society's publication may be said to contain a fair record of the members' work.

The Proceedings of Birmingham Natural History and Philosophical Society, Vol. XIV., part 2, edited by Prof. W. S. Boulton (pp. 57-112, 3/-) have been published. They contain the following valuable papers:—'Natural History Records of the Midlands; A survey of the Flora of East Worcestershire, by John Humphreys; Some effects of the Poison of the Wasp Sting upon the Heart of a Frog, by Prof. E. Wace Carlier; The Downtonian of South Staffordshire, by W. Wickham King and W. J. Lewis; On Blattoid and other Insect Remains from the South Staffordshire Coalfields, by Herbert Bolton; Mammalian Remains in the Glacial Gravels at Stourbridge, by Prof. W. S. Boulton. We are glad to find that this old established Society is still continuing its useful contributions to science.

FIELD NOTES.

BIRDS.

Separation of the Sexes of the Chaffinch in Winter.—Referring to Mr. E. P. Butterfield's note and Mr. R. Fortune's comments thereon in *The Naturalist*, p. 75, it must be over forty-five years since I controverted (in one of the then Natural history journals, *Young England* I think it was), so far as this district is concerned, the statement in ornithological works that the sexes of the Chaffinch separate in winter. I there stated that here, at any rate, there is no separation in winter, both sexes always being seen together in about equal numbers. I have never had any reason to modify that statement, until a few weeks ago, when during the severe weather at the end of December, or during the first few days of this year, there was a considerable invasion of chaffinches (probably indeed a big invasion, if one had had time to visit the different sides of the town to see it). In the hedges, and on the roads near my house, they were very abundant, and I even saw the bird feeding in one of the streets in the middle of the town. All of them so far as I noticed were females. But they were evidently not resident birds, and were only noticed for a few consecutive days. Our birds I have no doubt, were just as mixed in the proportion of the sexes as heretofore.—Geo. T. Porritt, Huddersfield, February 5th, 1918.

—o—

Status of the Pied Wagtail in Winter in the Wilsden District.—Mr. Booth (*The Naturalist* p. 77) hardly quotes correctly from my note (*loc. cit.* December p. 391). What I said was this bird '*almost* always leaves this district in winter to a bird.' Within a radius of a mile or thereabouts of this town I could count on the fingers of one hand all the Pied Wagtails I have seen for fifty years. I saw one specimen here in the main street in the very hard winter of 1879-80, and with the exception of two or three individuals, am not sure whether I saw another until the winter of 1916-17, when one was about my poultry run all through the winter. I see them some times in the valley, especially about the sewage disposal works. On the 13th of January last, I saw at least six pied Wagtails at the Bingley Sewage Works, and I saw them again on the following day, but I have not seen one so far this winter in this immediate neighbourhood, which is somewhat too elevated for this species in winter. As Mr. Booth states, it is very fond of the neighbourhood of sewage works, and in such environment, its plumage presents a bedraggled appearance, in contrast with those emigrants which have wintered further afield, and will reappear in about another month. — E. P. Butterfield, Wilsden, February 2nd, 1918.

Young Grey Seal caught at Hornsea.—In *The Field* of January 12th, 1918, p. 70, Mr. R. I. Pocock, of the London Zoological Society, reports a Christmas gift of a very young Grey Seal (*Halichœrus grypus*) to the Society, by a Hull fish merchant, Mr. G. T. Witherwick. Mr. Pocock points out that the Society almost invariably receives its Grey Seals from the Western coast of Great Britain; the Common Seals (*Phoca vitulina*) on the other hand, coming from the Eastern coast and from the South coast of England. He therefore deduces that this baby Grey Seal will probably have travelled from the 'Shetland Islands, where the species is known to breed.' Mr. Pocock has evidently overlooked that there is a well-established and breeding colony of Grey Seals off the North-umbrian coast—on the outer group of the Farne Islands. The Grey Seal differs from the Common Seal in the large size (and weight) to which it attains, and also in the elongated muzzle—(*i.e.*, dog-faced) and also in its dentition—a difficult matter to verify in most mounted specimens; but a very dangerous one to attempt with the living animal—even if only a baby. But the chief scientific difference, and in my opinion the only justifiable reason for placing it in a separate genus from *Phoca*, is that it brings forth its young at a most unseasonable time of the year, viz., in October and November.* But with the exception of this colony of Grey Seals on the Northumbrian coast, the Common Seal is undoubtedly the Seal of our Eastern coasts. Twenty to twenty-seven years ago I have many times watched the Common Seals in scores in the Wash, more particularly in what is known as the 'Boston Deeps.' Their round heads, just above the water whilst watching, appeared almost exactly like cannon balls, and I was assured by many reliable friends that they bred regularly in early summer on the Lincolnshire coast of the Wash; but of this I was never able to afford the time for an ocular demonstration. Mr. T. Sheppard, M.Sc., tells me that Mr. G. T. Witherwick informs him this young Grey Seal was caught at Hornsea. Therefore the record that a young Grey Seal, which Mr. Pocock computes as not being more than a month or two old, being caught so far south on the Yorkshire coast as Hornsea in December, is worth being placed on the records of the Yorkshire Naturalists' Union.—H. B. Booth, Ben Rhydding.

—o—

The Museums Journal for January contains an article on 'Attempted Usurpation of the British Museum'; a report on 'Local War Museums,' by Messrs. F. R. Fowley and T. Sheppard, and a paper on 'Transparent Preparations of Animal Tissues by the Spalteholz Method,' by Mr. R. H. Burne.

* Mr. Edmund Selous has published in this journal for 1915, some very detailed and valuable observations on the breeding habits of this species.

NEWS FROM THE MAGAZINES.

The Irish Naturalist for February contains an excellent portrait of the late Professor Edward Hull.

Mr. H. Britten describes *Choleva angustata* F. and its Allies, in *The Entomologist's Monthly Magazine* for February.

Mr Alfred Bell has an illustrated article on 'The Age of the Suffolk Boxstones,' in the *Geological Magazine* for January.

Mr. J. A. Wheldon continues his paper 'On the Collection, Taxonomy, and Ecology of the Sphagna,' in *The Lancashire and Cheshire Naturalist* for December.

Mr. Hans Schlesch favours us with a copy of his paper 'Fauna der isländischen Land-und Süsswasser-Mollusken,' reprinted from *Nyt Magazin for Naturvidenskaberne*, Christiania.

The death is announced of Miss Ethel Sargent, who was President of section K (Botany) at the Birmingham meeting of the British Association, being the first woman chosen to preside over a section.

We have received an interesting paper on 'Quadruple Hybrids in the F^1 Generation from *Oenothera nutans* and *Oenothera pycnocarpa*, with the F^2 Generations, and the back and Inter-crosses,' by Prof. Geo. F. Atkinson, reprinted from *Genetics* 2 : 213-259, May, 1917.

Wild Life for January contains the following papers. most of which are illustrated :—Guillemots and Razorbills, by F. B. Kirkman ; The Common Sandpiper in the Thames Valley, by E. E. Pettitt ; The White Stork, by G. S. Felton ; The Ringed Plover, by H. Vardey ; and Abnormal Colour in Mammals, by F. D. Welch.

Mr. H. G. Alexander, in *British Birds* for February, records an 'Albinistic Yellow Wagtail in Yorkshire' (in Wensleydale). On another page, but in smaller type, the same writer tells us that some rare *Phylloscopi* previously recorded by him in Kent, Sussex, etc., were wrongly identified. We are thus gradually clearing up some of the wonderful south country records of rare birds which so frequently adorn the pages of our contemporary.

We learn from *Nature* that 'It was stated in one of the morning papers a few days ago that 'there have recently arrived in England evidences of the most important zoological discovery that has come to light since the finding of that strange beast, the okapi. . . . . The discovery proves very completely the existence of a new and hitherto unknown species of elephant, a real dwarf elephant.' All that has really happened is that two skeletons have just arrived in this country of a 'dwarf' race of elephant described in the *Revue Zoologique Africaine* in 1913. Thus the announcement of this 'discovery' is somewhat belated. The specimens just received are stated to be fully adult examples, but this is not yet certain and will be determined by Dr. C. W. Andrews, of the British Museum of Natural History, to whom they have been submitted. But we have known of the existence of dwarf elephants in Africa since 1906, when the first of its kind was discovered.

We notice a lengthy report of the Entomological section of the Yorkshire Naturalists' Union meeting, held in October, appears in the *Entomologist's Monthly Magazine* for January, and while such a long report in our contemporary is flattering to the Union and its work, we should like to give our readers a hint that *The Naturalist* is the official organ of the Yorkshire Naturalists' Union, and while we are delighted to see its work reported in other journals, we should like to impress upon our members the necessity of sending information of this kind to us promptly. Under the present conditions the space provided for recording scientific work is so small that it seems a waste to print the same information in two different journals, and certainly just now, when we have so much matter in hand, we hardly like to occupy our pages by a report which, through no fault of the editors, can only appear some time after a similar report has been published elsewhere.

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March 1st, 1918.

APRIL 1918. No. 735
(No. 509 of current series.)

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A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

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AND
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TECHNICAL COLLEGE, HUDDERSFIELD.
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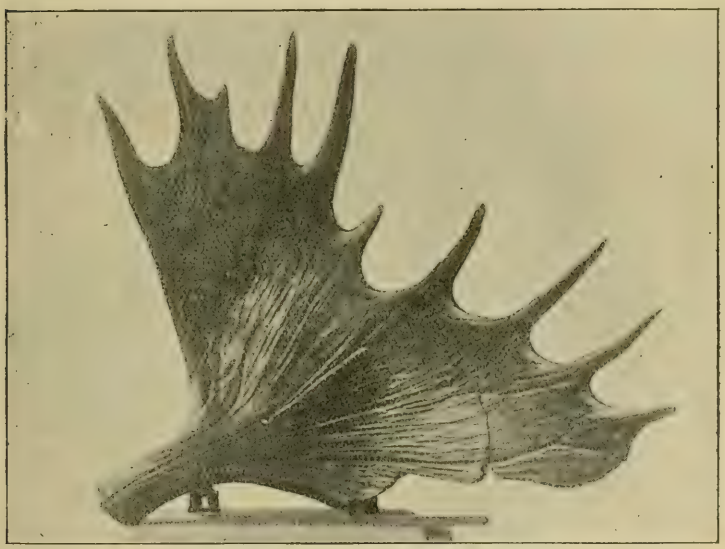
JUN 13 1920

NOTES AND COMMENTS.

PERTHSHIRE NATURALISTS.

The old established Perthshire Society of Natural Science still continues to record its valuable work in its *Transactions and Proceedings*, Part 4 of Vol. VI., of which has recently appeared. There are numerous interesting papers on the Archæology and Natural History of Perthshire, among which may be mentioned :—Note on Stone Cists found at Flawcraig and Burnfoot, in the Carse of Gowrie, by Henry Coates ; Local Museums and Archæological Research, by J. Graham Callander ; Some Aspects of the Forestry Question, by J. A. Donald ;



Sub-fossil Elk's Horn found at Methven.

Botanical and other Notes, by D. A. Haggart ; Note on a Sub-fossil Elk's Horn found at Methven, by Mr. H. Coates. The specimen referred to ' is the left horn [antler] of a young Elk, *Alces machlis* Gray. It measures 27 inches across.' It is still preserved in the hall of Methven Castle, and we are kindly permitted to reproduce the accompanying illustration from the Society's publication.

FACETTED PEBBLES.

At a recent meeting of the Manchester Literary and Philosophical Society, Mr. J. W. Jackson read a paper on ' The Association of Facetted Pebbles with Glacial Deposits.' The object of the paper was to place on record several recent discoveries of

facetted and wind-etched pebbles in localities near Manchester and in the Wirral peninsula, and to discuss the association of such pebbles with glacial deposits. The pebbles are of glacial origin, and all show the characteristic features of wind-erosion. The most noteworthy feature, however, is the large number of split and fractured pebbles, all of which exhibit the action of sand-blast on the fractured surfaces, in addition to other parts of the pebble. All stages towards the formation of typical 'Dreikanter' are exhibited. The splitting appears to have been independent of rock composition, as both igneous and sedimentary rocks are represented in the series; in the latter they are mainly split along joint-planes. The mode of occurrence shows that the pebbles were acted on by sand-blast after the disposition of the glacial beds on which they lay, and in this respect they agree with similar pebbles found in North Germany and in North America. It is suggested that the splitting is due to frost action, and that it is somewhat earlier than the wind-erosion.

WILD BIRDS' EGGS.

The Journal of the Board of Agriculture for February gives short descriptions of the various wild birds' eggs which it is proposed should be collected and used for food. 'The birds whose eggs are to be gathered are:—Black-headed Gull, Herring Gull, Lesser Black-headed Gull, Common Guillemot, Razor Bill and Puffin. Probably every seaboard county of England and Wales, except Suffolk, has gulleries, but of the inland counties it is believed that there is a gullery only in Staffordshire where the Black-headed Gull breeds. Nests of the last mentioned are often found in inland localities and, as a rule, are readily accessible; and it is this bird which is expected to yield the bulk of eggs put on the market.'

NORTHERN BREEDING SITES.

A list of the chief breeding places is given from which we extract the following relating to the Northern counties:—*Cheshire*: Black-headed Gull. *Cumberland*: Black-headed Gull; (Lake District, especially Ravenglass, near Wigton, Solway Flow and among the heather at Bowness); Lesser Black-backed Gull (very common on mosses and flows); Greater Black-backed Gull (Lake District and Solway Flow). *Durham*: Black-headed Gull (moors). *Lancashire*: Black-headed Gull (Walney Island and Winmarleigh Moss, near Garstang). *Lincolnshire*: Black-headed Gull (Brigg and Twigmoor). *Isle of Man*: Lesser Black-backed Gull, Greater Black-backed Gull, Puffin. *Northumberland*: Black-headed Gull (Pallinsburn); Lesser Black-backed Gull (on moors). *Westmorland*: Black-headed Gull. *Yorkshire*: Black-headed Gull (Skipworth Common, Locker Tarn, Wensleydale, Brows-

holme Tarn and Grassington); Herring Gull, Razorbill and Guillemot (Chalk cliffs from Speeton to Bempton, Flamborough Head); Puffin (Flamborough cliffs).

YORKSHIRE COAL SEAMS.

In the *Transactions of the Institution of Mining Engineers*, Vol. XIV., pt. 2, Prof. P. F. Kendall, M.Sc., has a 'Note on the Correlation of Certain Seams in the Yorkshire Coalfield.' He states that 'It is well known that a relatively unworked tract intervenes between the main area of the West Yorkshire field and that of South Yorkshire, and when some of the most important seams are sought on the northern side of this hiatus, they exhibit notable differences in their development, which not only gravely affect their value, but in some cases render their exact identification a matter of great uncertainly and difficulty. Green, in the memoir on "The Geology of the Yorkshire Coalfield, which is one of our greatest assets, suggested that an actual physical barrier intervened separating two areas of coal-growth at the time of deposition of the Silkstone Seam and at that of the Barnsley Bed.'

AND THEIR CORRELATION.

The net result of Prof. Kendall's enquiry 'is to confirm Green's classification and to establish that—Haigh Moor = Swallow Wood; Low Brown Metal=Parkgate; Middleton Main=New Hards or Swilley; Blocking or Barcelona=Silkstone; Beeston=Whinmoor. The employment of the name 'Silkstone' for the northern seam is sanctioned by over half-a-century of usage; and, if the South Yorkshire producers were disposed to cavil at the custom that has grown up, it might be pointed out that the West Yorkshire miners have paid the true Silkstone Coal the compliment of attaching its name to one of their very finest coals.'

A YORKSHIRE HERBARIUM.

Some years ago, Mr. H. J. Wilkinson, the Honorary Curator of Botany at the York Museum, began publishing a 'Catalogue of British Plants in the Herbarium of the Yorkshire Philosophical Society,' which has been printed, in sections, in the Society's Annual Report. The final part (XI.) has been published and is a substantial list of over 150 pages. In all, nearly 1,600 species are enumerated, with particulars of habitat, distribution, locality, date, collector and herbarium. The Catalogue, with index, occupies 344 pages, in addition to which is a 'Historical Account of the Herbarium . . . . . and the Contributors thereto' (27 pp.), from which we gather that the Society's Herbarium contains over 10,000 specimens, including collections of British Plants from Rev. James Dalton (1827-

1887), W. Middleton (1827), Giles Munby (1833) and Samuel Hailstone (1859). Yorkshire naturalists are certainly grateful to Mr. Wilkinson for his enormous work in making the botanical treasures of the York Museum available to students, and the Yorkshire Philosophical Society is also no doubt glad to have its Herbarium increased in value by the publication of the list. We are personally gratified to learn that some remarks of our own in 'Yorkshire's Contribution to Science' were the means of facilitating the publication of the Catalogue.

CHELLASTON GYPSUM-BRECCIA.

At a recent meeting of the Geological Society of London, a communication was read on 'The Chellaston Gypsum-Breccia considered in its Relation to the Gypsum-Anhydrite Deposits of Britain,' by Mr. Bernard Smith. This communication was designed to clear up some of the ambiguities that have arisen with regard to the actual mode of formation of the deposits of gypsum in Britain—chiefly from the point of view of the field observer. An attempt was made also to show the true relationship of the gypsum to the beds of anhydrite with which it is sometimes associated. A description was given of a remarkable breccia occurring at Chellaston in Derbyshire, and its origin was discussed. Important occurrences of gypsum in other parts of the country, as well as the alternative theories as to their mode of formation, were then reviewed in the light thus obtained. The remainder of the paper dealt mainly with the possible interchanges between anhydrite and gypsum. The place and the function of the fibrous form of gypsum were indicated, and a nomenclature suggested for certain isolated masses of the mineral.

CONCLUSION.

(1) At Chellaston the gypsum was laid down as such, and has suffered no appreciable alteration or addition since the time of its original deposition and brecciation. There is no evidence that the rock was ever anhydrous. (2) By comparison with this deposit, and also by independent evidence, it seems probable that most of the important beds of gypsum in the country were laid down as gypsum, and have behaved throughout as stratified deposits. (3) When anhydrite is present, the evidence favours the view that it is original, and was deposited in a stratiform manner in sequence with gypsum. (4) Microscopic evidence shows that there has been, in some cases, an alteration of anhydrite into gypsum where the two minerals were in original juxtaposition; this alteration, however, is considered to have occurred at, or immediately after, the time of deposition, and to be confined to the existing plane of contact of the two minerals.

FORESTS OF THE COAL AGE.

Dr. D. H. Scott, F.R.S., favour us with a copy of his paper

Lyginodendron oldhamium. Restoration, showing stem and roots, with the foliage; to the left above is a male frond. Observe the contemporary Dragon-fly. (*a*) Seeds in cupules, studded with glands, and borne on a branched stalk; (*b*) part of male frond showing discs and pollen-sacs. (*a*) and (*b*) slightly magnified. From drawings by Mrs. D. H. Scott.

on the above subject, which appears in the Volume LIV. of the *Transactions of the Institution of Mining Engineers.* It deals with the various larger forms of vegetation flourishing in

the Coal Age, and the paper is well illustrated by photographs, restorations, etc. The illustration reproduced herewith, by the permission of the author and of Messrs. Williams and Norgate, is a distinct advance upon the old-fashioned representations of coal floras.

'EARLY' MAN AGAIN.

'In fulfilment of a promise he had made to Mr. Reid Moir,' Prof. W. J. Sollas recently occupied a considerable amount of the valuable time of the Geological Society of London in connexion with a paper 'On a Flaked Flint from the Red Crag.' The flint was found by Mr. Moir near Ipswich, but Prof. Sollas admitted that the specimen was not indisputably of human workmanship, and that 'it is eminently a case of "not proven."' Prof. P. G. H. Boswell, who knows the geology of the district well, stated that the stratigraphical position of the bed was a matter of extreme doubt. 'From the time of the first discovery of these sub-Crag flints he had pointed out that the deposit from which most of the described and figured specimens had been obtained was not *in situ*—indeed, was one of a series of deposits highly disturbed by glacial action.' This seems to be borne out by Mr. Moir's own experience with the 'Ipswich man' skeleton.

'NOT PROVEN.'

Mr. Reginald Smith stated 'if the object of the paper was to open a discussion of the whole problem, he considered it belated; and if it was merely to make another addition to the suspense account, such a stupendous theory ought, in his opinion, to have been based on the best material available, not on one second-rate specimen. The author had rejected, as purely natural, a much more striking specimen in the British Museum.' Mr. R. M. Deeley explained how flints were fractured and chipped in pipes formed in the Chalk.

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Distribution of the Grey Seal.—With reference to Mr. H. B. Booth's note (*antea*, p. 111), I may add that since the publication of my *Vertebrate Fauna of North Wales* I have obtained many additional data from this area. These point to the conclusion that many observers have confused together the two species—Common and Grey Seal. Several of the examples recorded in my *Fauna* under the head of 'Common Seal' were undoubtedly Grey Seals. Furthermore I am now satisfied that the latter is the only seal that is a resident and breeds off the Welsh coast. On the other hand the Common Seal occurs on the Welsh coast only as an occasional and irregular visitor, chiefly in winter. I have in hand a *Supplement* and epitome of the *Fauna* which will be published as soon as conditions in regard to paper and print allow!—H. E. FORREST.

HOLOCENE SHELLS AT RUCKLAND, NEAR LOUTH, LINCOLNSHIRE.

C. S. CARTER,

In their play at ' Primitive Man,' the children of the Gypsy's Parson, Rev. Geo. Hall, excavated a ' cave ' in the hillside, in the Rectory Grounds, Ruckland, near Louth.

In this excavation they cut through a large basin-shaped pit in the chalk. This pit had been filled in with small water-washed stones and dark earth in which were found various objects of interest, consisting of fragments of Pottery, bones, seeds, shells, charcoal, etc.

The cave when finished was about 8 ft. in length, 5 ft. in width, and about 4½ ft. in height and was entered by a low winding tunnel about 5 ft. or 6 ft. long. Mr. Hall invited me over to see the children's cave and the objects they had found. These latter they entrusted to my care for further investigation, together with a box of the soil to wash. It was hoped to extend the excavation for the purpose of more definitely determining the nature and date of the deposit, but it was found almost impossible on account of tree-roots and buildings.

The objects found were submitted to A. Santer Kennard, F.G.S., to whom students of Holocene Deposits are indebted for the immense amount of information now accessible. His remarks are incorporated in the following notes on the objects found.

Pottery.—There are eight fragments of pottery representing probably four or five vessels. One fragment (half the base) is ' decidedly well made and is probably of Romano-British Age, as is also a small fragment of a rim.' The remainder belongs to a different class ; ' it is ill made, badly fired and made from bad material and may well be of local manufacture ; there is nothing distinctive about it, but it is not improbably of Romano-British Age, since similar pottery often occurs on the site of Romano-British Villages.'

Seeds.—These consist of Hawthorn, Galium (?), Elder, Medick (?) and others not easily determinable. One hawthorn ' stone ' showed signs of having been gnawed by a small rodent.

Bones.—These were not in great quantity, but were of interest, particularly a portion of a Red-deer Antler.

Bos longifrons (Ox).—Five teeth and the basal portion of a horn core may well be referred to this species, and probably some of the fragments also belong to this species.

Aries sp. (Sheep).—Six teeth and one bone.

Microtus agrestis (Field-Vole).—A molar.

Soxex sp. (Shrew).—A few bones.

Rana temporaria (Frog).—A few bones.

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Cervus elaphus (Red Deer).—' By far the most interesting object found,' says Mr. Kennard, ' is a portion of a Red-deer Antler. It comprises the first tine, the pedicle and part of the frontal bone, and bears obvious traces of human handiwork. The main portion of the antler has been removed by hacking on three sides, and the removal was completed by breaking. An attempt has apparently been made to remove the pedicle and frontal bone. The point of the tine has also been hacked, evidently to obtain a point. It is by no means improbable that at one time it served the purpose of a pick. The animal

Red-deer Antler Pick, Holocene Deposit, Ruckland, near Louth, Lincs.

to which it belonged must indeed have been a " Royal Hart." ' A portion of a lower jaw and a loose molar belong to this species.

Mollusca.—Thirty-five species, or 36 if the *Arion* granules be referred to two species, as I believe should be the case, have been found. Of this number no fewer than 17 species were identified in the collection made by our juvenile archæologists who kindly supplied me with a box of the soil, measuring about 10 in. × 9½ in. × 9½ in. From this soil by means of washing I was fortunate in collecting 35 species. It will therefore be observed that this deposit is rich in shells, some of which are of considerable interest, being either new records for the county, or are rare. The species obtained were:—

Limax maximus, one example.
Limax arborum, rather rare.
Agriolimax agrestis, fairly common.
Vitrina pellucida, one example.
Vitrea crystallina, fairly common.
Polita cellaria, fairly common.
Polita nitidula, fairly common.
Polita pura, fairly common.
Polita rogersi, one example.
Polita radiatula, five or six examples.
Euconulus fulvus, one example.
Arion sp., abundant.
Punctum pygmæum, fairly common.
Pyramidula rotundata, very common.
Helicella itala, fairly common.
Hygromia liberta, fairly common.
Hygromia hispida, rather rare.
Acanthinula aculeata, fairly common.
Vallonia pulchella, common.
Vallonia costata, rather rare.
Vallonia excentrica, fairly common.
Helicigona lapicida, five or six examples.
Helicigona arbustorum, one example
Helix nemoralis, rare.
Ena obscura, rare.
Cochlicopa lubrica, fairly common.
var. *exigua*, rare.
var. *lubricoides*, rare.
Cæcilioides acicula, abundant.
Pupilla muscorum, fairly common.
Vertigo pygmæa, fairly common.
Clausilia laminata, common.
Clausilia bidentata, fairly common.
Clausilia rolphii, rare.
Carychium minimum, common.
Pomatias elegans, common.
Acicula lineata, two examples.

Notes on some of the foregoing Species.—*Euconulus fulvus* is of particular local historic interest. It was first recorded by Dr. Martin Lister in 1678 for Lincolnshire:—

> Titulus IX. *Buccinum parvum sive Trochilus sylvaticus agri Lincolniensis. Vix piperis grani dimidium implet. Ei color subflavus, pellucidus. Ejus basis planior, senis aut septem orbibus in modum Trochili finitur. In musco ad grandium arborum radices in sylvis Burwellensibus agri Lincolniensis non semel eam inveni: est tamen ad modum rara bestiola.*
>
> De Cochleis Terrestribus, p. 123, 1678, note to figure 10 on plate 2 is so; probably the engraver was unable to render it justice.

Lister's locality, Burwell Wood, is within three miles of Ruckland Rectory. This species is now fairly common in Burwell Wood.

Arion sp.—Regarding the calcareous granules referable to this genus, Messrs. Hinton and Kennard, in a paper on the Molluscan remains from Cleeve Hill (Cotteswold), 1904, remarked 'It is notoriously difficult to determine the species of this genus from these scanty remains,' and yet, in all probability, at least two forms are present—*A. ater* and *A. hortensis*. Of the examples found in this deposit, and submitted, Mr. Kennard writes:—'After careful consideration, I think it better to call them all *Arion* sp. The granules you call *hortensis* may be that species, for that form of granule is common in *hortensis* but it also occurs in *ater*.'

Helicigona lapicida is a rare species in North Lincs., especially living. Burwell Wood and South Thoresby are the only localities, as far as I know, for which it has been recorded living.

Cæcilioides acicula. Many of the shells of this species are exceedingly fine examples.

An interesting, very small form of *Pupilla muscorum* was found, of which Mr. Kennard writes: 'similar very small forms occurred in the Holocene of Cissbury, Sussex.'

I have collected a similar small form living in Haugham Pasture, a wood a short distance to the north of Burwell Wood, which is within three miles of Ruckland, and I have also received other examples of this form from the veteran collector, Mr. J. Hawkins, collected near Grantham.

Clausilia rolphii. Of this species, Mr. Kennard writes :— 'this is an extremely interesting form since it is extremely rare in a fossil state.' This species was first recorded for North Lincs. by Mr. W. Denison Roebuck, in his pioneer list, 'Lincolnshire Mollusca,' *The Naturalist*, August, 1887; the specimens having been discovered in that year (1887) in Burwell Wood, Haugham Pasture and the neighbouring Maltby Wood, by H. Wallis Kew. At that time these localities were the most northerly from which it has been recorded. Since then it was found (in 1905) in Claxby Wood, north from Market Rasen. It was collected more than fifty years ago by Mr. J. Hawkins in Ropsley Rise, near Grantham, South Lincs.

Pomatias elegans, though a common species in this deposit, is now rare living in the district, Burwell Wood being the nearest, and until a few years ago the only locality in North Lincolnshire, where it has been found alive, although keen search has been made for it in other places where dead shells have been found. This species is also of particular local historic interest, for in 1678, Dr. Martin Lister recorded that he found it in Kent, Yorkshire and 'also at Burwell Woods, in Lincolnshire' (De Cochleis terrestribus, p. 120), where it was re-discovered in 1886 by Mr. H. Wallis Kew.

Acicula lineata. This species, as far as I know, has not been previously recorded for Lincolnshire, nor has it yet, I believe, been found alive.

It is significant that the three commonest species, *H. virgata*, *H. caperata* and *H. gigaxii*—now living within a few yards of this deposit, have not been found therein. It is also noteworthy that although extremely abundant in the East and South-east of England at the present day, *Helicella virgata* and *H. caperata* are quite unknown from any Holocene deposit which can be shown to be Roman or earlier, clearly proving that these two species are quite modern immigrants, though there can be no doubt that they are truly native in the South West. *Helicella gigaxii* may also be a modern introduction into the neighbourhood, though in Kent it occurs in undoubted pre-Roman deposits. The absence of *Helix aspersa* is noteworthy, for as a rule it is a constant associate with Roman remains.

Mr. Kennard remarks, in writing of the Ruckland discovery, 'In all probability we have here an artificial excavation in the chalk of probably Romano-British Age, which has been filled up by a wash from the hillside above; such pits are known to occur in Romano-British villages, numbers having been found during the excavations in Wiltshire by the late General Pitt Rivers, and it is to be hoped that excavations will be made and thus throw additional light on an extremely interesting discovery.'

It should perhaps here be mentioned that many years ago Roman remains were found about a quarter of a mile further down this valley, and the discovery recorded in the Proceedings of the Society of Antiquaries.

In the field immediately to the North-east of the Rectory Grounds, the Rev. George Hall found a very fine early Neolithic Flint Implement; and other flint flakes, etc., have since been found in the immediate neighbourhood.

The Holocene deposits in Lincolnshire have not yet received the attention they deserve and there can be no doubt that when they have been investigated, many interesting and important facts will be brought to light.

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HEPATICS OF THE HEBDEN BRIDGE VALLEY.

WM. HY. PEARSON.

I HAD the pleasure of visiting this interesting locality last September in the company of Messrs. Broome Barrett and Greenwood, and thanks to the guidance of Mr. Broome was able to collect nearly all the rare hepatics for which the Valley is famous.

It was at Hebden Bridge that Samuel Gibson lived 60 to 70 years ago. He was a keen botanist and known to the readers of the old botanical journals as a very controversial one; he was a blacksmith by trade and it is rather remarkable that the botanist who has given such lustre to this neighbourhood should also have been one, the late James Needham, who died a few years ago.

Part of Gibson's herbarium is in the Salford Peel Park Museum, or at least it was about 50 years ago, when I was in the habit of consulting it, along with the 8 volumes they had in the library of the old Sowerby's 'English Botany.'

Mr. Broome, by his intimate knowledge of the Hebden Bridge Valley, made my visit of a few hours eminently successful; to be taken direct to where all the rarities grew was an experience I have never had before.

We began by collecting *Nardia geoscypha* De N., a very

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rare species on banks, unfortunately associated with the common *Nardia scalaris* Schrad., with which it is closely related; later on, on rocks the common *Lophozia ventricosa* Dicks. was met with, and on wet banks *Aplozia sphærocarpa* Hook.; on rocks and at the base of old trees *Lepidozia reptans* L. was the most prevalent species: then following a small water course, on the stones by its side *Scapania umbrosa* Schrad., a rare species was met with with sparingly. On a rock further up the Valley I got a little of the rare *Scapania curta* Mart.

The greatest of all rarities for which Hebden Bridge is famous is *Lophozia atlantica* Kaalaas, this was growing in considerable abundance on an old wall, also associated with *Lophozia Floerkii* Web. and M., with which it had hitherto been confused, but there was no difficulty in recognising the difference between the two species in the field.

I had received many years ago small specimens from Hebden Bridge, collected by James Needham, of *Jubula Hutchinsiæ* Hook., and imagined I should have to search diligently for it. I was extremely surprised to be taken to a stream where it was growing in abundance, along with a beautiful form of *Chiloscyphus polyanthus* L., this was also growing abundantly.

Jubula Hutchinsiæ Hook. was originally collected in the South of Ireland more than a hundred years ago by a young lady botanist, Miss Hutchins, and named in her honour by Dr. Hooker; the beautiful limestone crucifer *Hutchinsia petrea* also commemorates her.

Recently the American hepaticologist, Prof. Evans, has monographed the genus *Herberta* Gray and reports that all the European forms of that genus resolve themselves into three species, *Sauteriana*, *adunca* and another which he had published as *Herberta Hutchinsiæ*.

Mr. Broome and I searched carefully for *Scapania subalpina* Nees, but did not meet with it, although in the Report on the visit of the Yorkshire Naturalists to Hebden Bridge in June, 1904, it is referred to as the dominant liverwort of the Hebden Valley; all our specimens are *Scapania purpurascens* Hook.

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In the *Proceedings of the Geologists' Association*, Vol. XXIX, pt. 1, recently issued, Professor H. H. Swinnerton has an illustrated article on 'The Keuper Basement Beds, near Nottingham.'

We much regret to learn of the death of Dr. Marten Perry, of Spalding, which took place on Feb, 19th. Dr. Perry had reached the ripe old age of 92 years, and was quite active and walking about Spalding to within a few days of his death. He was a keen antiquary, and was greatly interested in the Spalding Gentlemen's Society, one of the oldest Antiquarian Societies in the county, if not the oldest. For many years he was its President, and had much to do with the erection of its lecture room and Museum, which was opened a few years ago. Among his writings is a History of this Society.

ALIEN MOLLUSCA IN YORKSHIRE.

J. A. HARGREAVES AND J. DIGBY FIRTH, F.L.S.

FROM time to time various records of alien mollusca in the county have been made in different magazines. In 1885 a living *Helix lactea* was obtained at Pateley Bridge; several different genera have been obtained at Hull from ships bringing cattle bones and other goods, but we have not been able to find records for Yorkshire of living molluscs having been imported with grain, though frequent mention occurs in isolated paragraphs of specimens imported with currants, bananas and other fruits and vegetables both in Yorkshire and elsewhere; while Mr. J. W. Clarke has shown *Helicella caperata* taken from the feathers of an immigrant bird immediately after landing on the East Coast.

Further records are given in Kew's 'Dispersal of Shells.' Living specimens of foreign helices were obtained by us from the vicinity of Wakefield, and subsequent search resulted in the production of over 100 specimens, of which about one third were alive when procured. They were obtained from barley 'screenings' and were accompanied by large numbers of seeds of alien plants, the growths from which have been examined by the Leeds Naturalists, a detailed record having been made. In the screenings were also found many more or less fragmentary specimens of Tenebrionidæ, mostly alien species of *Blaps*.

Careful search was made on more than one occasion to see if any of the molluscs were able to establish themselves in the neighbourhood. Most of the screenings were deposited on the sloping banks of a large deep pond in a disused quarry, and here also several living specimens were obtained, along with many dead shells. Poultry had free access to the rubbish heap, and apparently only a few molluscs escaped their vigilance. In this district where the soil is not calcareous, poultry are naturally keen on the shells of molluscs, and in one place where the screenings had been levelled, and afforded a better opportunity for seeing them, scarcely a vestige of a shell was to be seen, showing how closely the mass had been scrutinised by the birds. It appears fairly certain that there is very little probability of the molluscs establishing themselves in the neighbourhood unless protected from capture by birds.

Mr. J. E. Crowther of Elland has obtained a number of molluscs from imported barley when it was being steeped, the snails rising to the surface. His commonest shell, as at Wakefield, was *Helicella pyramidata*, which comprises over two thirds of the specimens.

It is perhaps advisable to place on record the species obtained. For the identifications we are indebted to Mr. J.

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R. le Brockton Tomlin, M.A. Up to the present, the species found are as follows :—

From Elland :—
Helix vermiculata juv. Müll.
Helicella emphorca Bourgt.
H. terrestris Penn.
H. mauritanica Bourgt.
H. pyramidata Drap.
H. numidica Bourgt.
H. affinior Deb.
H. globuloidea Terv.
Leucochroa candidissima Drap.

From Wakefield :—
Helix vermiculata Müll.
H. melanostoma Drap.
H. nissleri Pall.,
Helicella pyramidata Drap. and varieties *monozona, alba, marmorata, depressa* and *conica.*
H. rhodocheila West.
H. numidica Bourgt.
H. cespitum Drap.
Leucochroa candidissima Drap.

together with broken valves of non-British *Anodonta* and *Unio*, and odd specimens of *Cypraea annulus*, the latter presumably dropped on the land surface whence the barley came.

The general facies of the above indicates an origin from Northern Africa, a conclusion which Mr. Horrell tells us is partially but not fully confirmed by the plants and the beetles found with them.

Mr. J. F. Musham of Selby has drawn our attention to quite a different source for alien molluscs. The Yorkshire Dyeware and Chemical Co. at Selby, import from Jamaica large quantities of logwood for the purpose of extracting dyes for commercial use. The wood arrives in the form of large logs which are unloaded from the canal extending by the works. In unloading and drying the wood many animals which have been secreted in the crevices of the logs make their presence known. Recently living examples of a fair sized lizard, scorpion, hermit crab and a large cockroach have been seen, together with numerous empty shells of land and marine mollusca. Mr. R. Standen of the Manchester University has indentified most of the mollusca and Mr. J. R. le Brockton Tomlin the remainder, none of which were alive when found.

The *Lucerna* are characteristic of and confined to Jamaica. The species found are as under :—

Neocyclotus jamaicensis Ch.
Helicina neritella Lam.
Colobostylus redfieldianus C.B. Ad.
Lucerna picturatus Adams.
Many.
L. soror Fér.
Lucerna acuta Lam. var.
L. subacuta Pfr.
L. subsloaneana Pils.
Livona pica L.
Littorina sp., indistinguishable from *L. littorea.*

All these are land shells except the last two, which are marine. There is no question of establishing themselves as all were dead when obtained. Similar importations with logwood have long been recorded for San Francisco and Germany.

The writers would be glad to learn of any other Yorkshire instances.

ROMANCE OF THE CUCKOO

E. P. BUTTERFIELD.

(*Continued from page 96*).

Macgillivray, in examining a female Cuckoo, found no fewer than twelve eggs in progress of development, and these were disposed in separate clusters, one of which contained three, another six, and the third three. As to the interval between the laying of each egg, which may be variable, there is some doubt, but some individuals have been thought to lay about every third day. Most of the Cuckoo eggs are laid here between the middle of May and middle of June.

In other parts of Britain, eggs of the Cuckoo have been found from early April to, I believe, as late as August—but these are rare instances.

The incubation of the egg of Cuckoo lasts twelve or thirteen days. The young, when newly hatched, differ little from young Pipits, except in point of size, but soon their skin begins to darken, and before they are many days old they are repulsive looking creatures. and grow enormously during the first three days. Before they are two days old, they usually begin to hoist out of nest any young or any unhatched eggs belonging to the rightful owner, and this they do by a method which, unless one has first witnessed it, would be considered incredible. The young Cuckoo, which at this age is very restless, and is constantly trying to insinuate itself beneath the bodies of its foster brothers until it gets one into a favourable position, that is, in the hollow of the back, when it begins to clamber backward-way up the side of the nest, balancing the young bird on its back by elevating its elbows, till it reaches the top, when it throws off its burden. As if to make assurance doubly sure, that its work has been successful, it remains for some little time in this position, the extremities of its wings being kept in motion, and then falls forward into the nest. I confess, when I first saw this feat accomplished, my language was more expressive than prudent, and I had a strong desire to pitch the young Cuckoo out of the nest ; nevertheless, the sight is one of the most marvellous phenomena connected with bird-life. This intense desire to throw the rightful occupants out of the nest begins to diminish when a few days old, and it remains blind for about a week, at which age it has more the appearance of a miniature hedgehog than a bird, but at the end of the second week he is getting a fine fellow, and when any intruder approaches, he raises himself in the nest, with his feathers about the head all erect, and offers fight by sparring and plunging forward ; and it remains in the nest until it is three weeks old. The call-note of the young Cuckoo which has been reared by a Titlark is an exact reproduction of the call-note of its foster

parents, and I have wondered, when the Cuckoo has been reared by other species than the Titlark, whether it has the same call-note. I have kept young Cuckoos which have been reared by Titlarks, and sometimes have taken them about with me in my rambles. It is often said that small birds in the presence of the Cockoo mistake it for a Hawk ; but I cannot share this belief. I placed a young Cuckoo on a wall recently in the neighbourhood of a Titlark's nest—five Pipits, a Lark and Wagtail soon assembled. Certainly the Pipits belonging to the nest hustled the Cuckoo off the wall once or twice but the other Pipits evinced more curiosity than anger, and kept flying from one side to another and appeared to be fascinated for over a half an hour. At last two Pipits kept flying down into the pasture and back to the Cuckoo ; this they repeated a good many times. I took the Pipits to be seeking for food, but did not see them offer any to the Cuckoo. I took my young Cuckoo again to the moor and sat down near a Titlark's nest containing a young Cuckoo, and placed my Cuckoo a few yards away. Soon a good many Titlarks assembled, two of which played about the Cuckoo as long as I remained sat down without manifesting the slightest fear : to me they appeared as if they wanted to feed the young Cuckoo. After this incident, on returning home, I sat down on the edge of a wood, soon after which a Sparrow Hawk flew over my head, which was a signal for all the birds in the neighbourhood to scamper off into various hiding places, and I could not help contrasting the behaviour of the bird at the approach of the Hawk, with the Pipits in the presence of the Cuckoo.

The young Cuckoo has an enormous appetite, so much so, that when I have given its meal, I have often declared that ' it must be all stomach.' And soon after being fed—and even when well fed—it would, like Oliver Twist, cry for more. Gratitude it may have, but it is in an Irishman's sense : ' A lively sense of favours to come.' When I have had no other food, I offered it a young frog, which it swallowed with apparent relish.

The climbing habit of the Cuckoo when young is much more marked than in the adult. It will climb about a cage much after the manner of a Parrot, and when I let it have the run of the greenhouse, it could cling with great facility to the ledges.

When it was being fed, it shook only one wing, lifting it quite high instead of shaking both wings as most young birds do ; it would follow me about in the garden when I was turning over the earth to find worms. One day it left me and flew to a neighbour's garden, thence to the main street and came back to an ash tree at the bottom of my garden, from which I could not dislodge it. After leaving it for an hour it flew down when I began to turn over the earth in the garden in the expectation, I presume, of having more worms.

It has been asserted by some naturalists that the Cuckoo has been known to take some interest in its future offspring, but I have spent much of my leisure time near the nests which have contained Cuckoo's eggs, from the time the eggs have been laid, to the time of the young Cuckoo leaving the nest, but I have never seen anything in their behaviour which would lead one to support this assertion. I should not, however, like it to be inferred that I deny that occasionally this may be done by individual Cuckoos, for there is no limit to their vagaries.

Contrary to what one might expect, the Cuckoo will sometimes not only take all the eggs in a nest, afterwards depositing its egg, but in such instances, the eggs of the dupe usually have been known to have been incubated for some time, but for some inscrutable reason, it will rob nests of all their young, and it is even said that it will sometimes remove a foster parent from a nest, in which it intends to deposit its egg. Such an instance is recorded in *The Field* by Mr. C. Wickam, Manchester, whose gardener saw a Cuckoo fly down to an ivy-coloured wall and emerge in a moment carrying in its beak a Wagtail held by both wings and flew to some distance with its burden. On inspecting the nest a Cuckoo's egg was found, but the Wagtail forsook the nest.

Young Cuckoos, after they leave their nests on account of their wandering habits, are very apt to lose their foster-parents, and such is the fascinating power of the young Cuckoo in such circumstances that it would seem there is usually no difficulty in attracting other birds, other than its foster-parents, to provide for its physical needs. A young Cuckoo has been known to have been attended by no fewer than six Pied Wagtails, and even in some instances, it has been known to have been fed by two, if not three, different species of birds.

As to the origin of the parasitic habits of the Cuckoo, many theories have been advanced, all more or less unsatisfactory, the comparative long interval which elapses between the laying of each egg, being perhaps the most important factor. Another assumption given is that on account of the bulk of the adult, Cuckoos having to migrate by the middle of July, said to be for lack of food, the time is insufficient, and the Cuckoos would have to migrate before the young ones could shift for themselves. But the question might still be asked, why should Cuckoos migrate by the middle of July, for food at this time is more abundant than at any other period since their arrival? It used to be thought that the Cuckoo lived almost exclusively on large hairy caterpillars, but such is by no means the case, their food being quite as varied as that of most other birds.

Most naturalists now assume that the Common Cuckoo is polyandrous, and a few even assert it is so in a marked

degree, and it is significant that the same 'feature exists, or is in course of being developed among many other wholly, or partially parasitic species such as the American Cowbirds and Cuckoos.' Dr. Fulton, writing from New Zealand in *Nature*, states 'that contrary to the usual opinion, there are numbers of instances known where Cuckoos (species not stated) have supervised the forced adoption of their offspring by other species, have assisted in their feeding, and have reclaimed and taken them away from their foster-parents.'

Another feature in the economy of the Cuckoo is the relatively small size of the sexual organs of the male, at the season of what should be their maximum development, and this has been a source of not a little speculation, but this may be connected with the preponderance of males resulting in a loss of parental affection.

There are other points in connection with our subject, about which much speculation exists, but into which I will not now enter, but merely refer to one other matter as it illustrates 'Dimorphism,' and has reference to that curious phenomenon which sometimes occurs in animals, where two varietal forms exist side by side without such cause being in any way traceable to local influences.

As is well known to naturalists, the young Cuckoo differs much from the adult, the plumage being a dark or ashy brown colour, barred with rufous, giving it a beautifully mottled appearance, with a white patch on the occiput, but there is also another phase of plumage confined, it is believed, to young birds only, the prevailing colour being rufous, sometimes a rich chestnut colour, similar to the plumage of a Kestrel, and it is somewhat curious that this form is chiefly confined to the female sex.

Perhaps, in conclusion, I ought to refer to the assertion made by some naturalists that the Cuckoo deposits its egg or eggs only in the nests of those birds that laid similar eggs to her own, but this is a statement much too sweeping in its character. There can be no denying the fact that, in a general sense, this may be true, but there are many remarkable exceptions, even in our own district, where the Cuckoo has deposited its egg in the nests of the Ring Ouzel and Whinchat, but such instances are rare, and in all probability, will be rarer in the future, since I have little doubt that the eggs of the Cuckoo have been and are undergoing a process of adaptation which will ultimately result in fewer faultily-matched clutches such as quoted above. Still it would be a difficult question to answer why the Cuckoo should have laid their eggs in the nests of Ring Ouzel and Whinchat in the height of the breeding season when there could have been no difficulty in finding more suitable nests, such as the Titlark and Skylark.

ORNITHOLOGICAL OBSERVATIONS AND REFLECTIONS IN SHETLAND.

EDMUND SELOUS.

OCTOBER 17TH, 1911.—Kittiwakes either fishing or floating idly and prettily on the water. Those fishing plunge, now, from a height, closing the wings and shooting some little way beneath the surface. To them enter certain Arctic Skuas, and fish, at secondhand for the fish that the Kittiwakes have fished for. His highly spectacular method brings an odium upon the more ingenious thief, here, which he does not at all specially deserve—it is often so amongst ourselves, indeed. The steward of a Shetland passenger steamer, though with no sort of tolerance for birds that fish more orthodoxly—Shags, for instance—or love for birds in general (or particular) was for destroying the whole race of Skuas, so indignant was he made by this sight, and the same spirit, higher placed and leading to wanton and stupid acts of destruction,* is to be found in larger vessels that go on scientific expeditions. To the man of uncultivated mind, indeed, the thought of any balance or adjustment—any nicety of interrelation between species and species—never occurs. He is, or would be, if he could, a great interferer with one, at the expense of another, though, at the same time, in larger ways, and through his higher-plane human brutalities, he will cheerfully bring both to extinction, and as many, to the boot, as may be.

These Skuas, like Vultures, follow one another to the prey, for if one makes chase of a bird that has been successful, his companion, or any other that may happen to see him doing so, joins in immediately, so that two, three or four—I have not seen a greater number—may be pressing one Kittiwake at the same time. Do the Skuas note, with accuracy, whether a Kittiwake has succeeded, or failed, in his plunge? I believe they do. One plunged whilst a pirate was flying quite close to him, but no pursuit ensued. This is in great contrast to the way in which, following each other, they sweep to the chase when, as is obvious, a capture has been effected, and thus, by the action of the Skuas, one can judge as to the result of each Kittiwake's attempt. A bird, thus persecuted, utters harsh, indignant-sounding cries. Some drop the booty quickly, but others show great obstinacy in not surrendering what they have caught, and will go down on the water, without doing so, the Skua—or Skuas—having, at last, to desist and go off. No

* *e.g.*, 'All that we could do to protect our friends' (the Adelie Penguins namely) 'was to shoot as many of these sea-leopards as possible' !!!!!! (the exclamation marks are my own). The above took place on the British Antarctic Expedition, 1910-1913.

actual attack is made—at least I have never seen this, and doubt if it is ever the case. Fishermen here assert—and they certainly belong to the class of persons having 'large opportunities of observation'—that if the fish, when relinquished, should be missed by the 'Bonxie' in its fall, the latter will never pick it up afterwards, prefering to lose it, if he cannot seize it before it strikes the water. But let not the amateur or cockney or 'week-end' naturalist be put off from doubting, or using his own eyes, by this, for, in field natural history, a mountain of opportunity produces commonly, a mouse of observation, and I have twice, now, within a short space of time (and also the other day) seen the Bonxie do this very thing. At least, under the required circumstances, I saw it dip down on the water for something, and for what else could it have been? One of these occasions was when two or three Skuas were chasing the same Kittiwake, but the successful robber was not molested by the others, and so it may always be—'Hawks should not pike out hawks' een.'

This piratical parasitism of the Arctic Skua upon Terns, Gulls, Puffins and other of its fellow fish-eaters, has, of course long been known, and is often referred to. Another, and, I think, still more interesting example of the same thing,inasmuch as, here, the interrelation of vassal and suzerain is between two species more widely sundered, if not (having regard to the last case) in structure, yet in their typical habits of life, one strictly a land, the other, not so strictly, a seabird, is apparently less well known, since, striking as the sight is, I have not been able to find any proper account of it—nothing coming at all near to what I have myself seen. It is *a propos*, I think, therefore, a little to diversify these northern notes with an extract from some others (or, rather, a summary of them) which I made years ago, far south, on the Dorsetshire coast. This appeared in the *Saturday Review*,* but only once, whereas field notes with anything in them, ought to keep on appearing, if we cherish the hope that a distant posterity will be better supplied with information than we ourselves are, in its standard works on ornithology—as surely we must, since it is pretty plain that, as things are going, it will be much worse supplied with the subject of ornithology—birds.† The extract is as

* April 12th, 1902.

† Hardly a day, now, but some proposition or exhortation appears in one or other of the papers, to no longer protect, to 'keep down' or even to wholly exterminate some bird that, without any counsel for the defence, and on a one-sided, 'hanging-judge' summing-up, is found guilty of being 'injurious.' It need not be *very* injurious. Let it but be shown to do any damage at all—to eat a few grains of wheat, mixed in with its insects, now and then (the grain, they say, mounts up—mum the insects)—and, straightway, kill, kill, kill, kill, kill!—a Hunnish pæan. There is no offset, apparently. However charming, however interesting, however instruc-

follows :—' The Gulls*—few in number, having regard to the extent of territory over which they work—stand motionless and watch the Peewits, as from so many little observatories. Of a sudden, one rises, and at the same moment, you catch the jerk forward of a Peewit's head, in the act of seizing something on the ground. As he jerks it up again, he sees the Gull, which is now almost upon him, and instantly takes to flight, followed by the latter, who, as soon as he is discovered, raises a loud wailing cry which seems to have in it something of an upbraiding quality, as though reproaching the Peewit for its ungenerous behaviour. The Peewit, deaf to these claims of Kultur, exerts itself to the utmost, to get away; labours, at first, its broad green fans, then, suspending their motion, shoots upwards, poises and comes rushing down in one—and then another—of those bold, gliding sweeps, so characteristic of the flight of this species. The Gull pursues, with cry on cry, draws near, overtakes and even, as it were, lays alongside the quarry, but seems purposely to refrain from actual violence; there is turn and turn, double and double, then, all at once, the pursuer, checking suddenly and often with difficulty its swift full-sail, drops plumb to the ground, picks up and devours something greedily, and either remains standing there, or, with a satisfied look, flies off to another part of the field. When one sees this once, one may think that the Gull has by chance seen something on the ground, and that the chase itself has been a more or less causeless act of aggression. But as the same thing happens again and again—goes on happening, in fact, as long as one stays to watch it—as first one Gull and then another bears down upon first one and then another Peewit, which latter has invariably either just found or just eaten something, this theory has to be abandoned and it soon becomes plain to sense and reason that the Gulls are systematically and of set purpose, robbing the Peewits. Sometimes one may see

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tively and æsthetically elevating, a bird cannot *pay* for its up-keep. The utilitarianism is gross—revolting. It is as though some dull boor were to slouch through the Louvre, the Vatican or the National Gallery, shrugging his shoulders, and regretting, at every step, that so much space, which might be more profitably filled, should be given up to housing mere knick-knacks. Is it really, then, a new conception to the educated, that a species —a perpetual, living being—is, in truth, a much greater masterpiece than those which—how great soever they may be—at the most but simulate nature? Is not *Sus scrofa*, after all, a little beyond 'The Florentine Boar'? Humanity, like Malvoleo, is 'sick of self-love.' How we should shudder at the threatened extinction of Gull, Goose or Magpie, if 'one of the old masters' had *made* them. What should we think *then*, of the 'passing' of the Eagle—or Bird of Paradise, that *chef d'œuvre* of how great a colourist?

* *Larus ridibundus* is the species—only quite lately threatened, as set forth in the note above. So charming a bird, the winter delight of our London parks and Thames bridges—largely, too, an insect-eater!

one of them make a mistake, that is, it will set out towards a Peewit, evidently under the impression that the latter has found something, but, all at once stop, as having discovered its error, and continue to watch and wait. Sometimes also, the attack or approach is so swift and silent that the Peewit, taken by surprise, flies hurriedly up, leaving its harvest on the ground, for the Gull at once to dispose of. As a rule, however, the Peewit is chased, and, as a rule, also—I should say at least four out of every half dozen times—it parts with what it has to the aggressor. In the cases where it does not, it either, by its obstinacy, tires the Gull out, or (here is another close parallel) owes its impunity to the rival efforts of two or more pursuers. For the most part, the Gulls stand at fairly wide intervals, over the land, but occasionally, two will be near together, and then, whichever of these first rises, the other will be sure to do so too, and to pursue either it or the Peewit. Great indignation is exhibited, in these circumstances, by both the marauders, each one of whom considers the other to be a trespasser upon his own rights. They assail one another in the air, their course becomes deflected and the Peewit escapes, an interesting and pretty illustration of the homely saying that 'When thieves fall out, honest men come by their own.' (Though perhaps the obscure subject of the strife might here demur).

Does the Peewit, when thus forced to relinquish what it has honestly and industriously acquired, merely drop it out of its beak, or is it made actually to disgorge it, as are Gulls themselves, in similar circumstances, by the Skuas? To make this out, through the glasses, is difficult, if not impossible, but it seems likely that in the majority of cases the latter is what occurs, strange as this may appear, for the Peewit has not, like the Gull tribe, the natural habit of disgorging its food. I can, however, see no reason why it should not as a rule swallow what it finds before the Gull is upon it . . . . On the other hand, it is possible that the Gull's approach—commencing from the first indication of success on the part of its quarry—may be so swift that the latter has rarely time to swallow, on the ground, and finds it difficult to do so during flight. If when the Peewit had once swallowed, it could be made to disgorge, we could better understand that curious change of intention which the Gull sometimes exhibits in the very midst of flying down upon it. The precise manner, therefore, in which the Peewit is robbed may be as open to doubt as it is in some other (higher) instances where the main fact is not less certain. A more interesting point is involved in the question of what is the precise mental attitude of the two birds towards one another. It might be thought that hostility, pure and simple, was the only possible one in such a case as

this, or that if the Gull had acquired a contempt for the Peewit, the Peewit, at any rate, must look with terror and resentment on the Gull. But if this last is the case, how is it that the two birds may constantly be seen standing almost side by side, with apparent indifference, and that, until the actual chase is begun, the Peewit never seems at all afraid of its persecutor. And then, too, an instinct would seem to have been developed in the Gull similar to that which restrains a shepherd's dog from biting the sheep, and only allows him to drive and hustle them. Though he pursues closely, he does not actually attack, and his very cries seem to express complaint, rather than anger, as though he were demanding what the Peewit, as well as himself, knew to be his due. It is at least possible that this may really be the case. However a habit of this kind may have commenced, when once the weaker bird had come to be terrorised by the stronger one, the latter would be likely, on the principle of 'least action,' gradually to accustom itself to threaten only, and the threat, in time, would be responded to more as an instinct than in fear of something that had ceased. Thus, to the Gull, the Peewit might become by degrees first a subject having duties, and at last a dutiful subject; whilst the Peewit would see, in the Gull, not so much an oppressor as an existing necessary state of things—in fact, an institution which would make it all right. This curious result to which our human experience may offer, here and there, some analogy, is perhaps the most interesting feature in a species of parasitism which is in itself full of interest. Indeed, we might almost call it commensalism, since the sooner the Peewit gives up what it has, the sooner it can get something else, which is gain too—of a sort.

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YORKSHIRE COLEOPTERA IN 1917.

W. J. FORDHAM, M.R.C.S., L.R.C.P., F.E.S.

(*Continued from page 102*).

Athous vittatus F. Roundhay Park, 6-16. S. D. F. Collingham, 6-16. E. C. H. *64. Escrick, 6-17. W. J. F. *61.

Trixagus (*Throscus*) *dermestoides* L. Collingham, 6-16. J. D. F. *64.

Helodes marginata F. Morton Wood, Hepworth. Several. Lower Harden Clough, Meltham, 7-17. W. Falconer. *63.

Scirtes hemisphericus L. Menthorpe Ings. One, 26-6-17, by sweeping. Extremely abundant on Sallows, 28-7-17. W. J. F. *61.

Podabrus alpinus Pk. Martin Beck Wood. H. H. C.

Cantharis bicolor Hbst. (*thoracica* Ol.). Menthorpe Ings. Several. 7-17. W. J. F.

Rhagonycha translucida Kry. (*unicolor* Curt.). Nunthorpe Wood, 7-17. W. J. F.

Rhagonycha lutea Müll (*fuscicornis* Ol.). A few on willows, Menthorpe Ings, 6-17. W. J. F.

Malthinus frontalis Marsh. Martin Beck Wood. H. H. C. *63.

Malachius viridis F. Escrick, 5-17. W. J. F. *61.

Corynetes cæruleus De G. Bubwith, in house, 6-17, probably parasitic on *Anobium striatum* Ol. (*domesticum* Fourc.).

Niptus hololeucus Fall. Sparrow's nest under eaves, Wilberlee, Staithwaite, 7-17. W. Falconer.

Ptinus tectus Boield. Leeds, in ground rice, 6-17. E.C.H. *64.

Leptidea brevipennis Muls. In baskets in Zoological Department, Leeds University, 7-17. E. C. H. *64.

Leiopus nebulosus L. Collingham, 6-16. E. C. H.

† *Cryptocephalus parvulus* Müll. Martin Beck Wood. H. H. C.

Cryptocephalus pusillus F. Martin Beck Wood. H. H. C. *63.

Timarcha coriaria Laich. Hawkesworth, near Ilkley, 8-17. W. J. F.

Chrysomela marginata L. Bishopdale Head. One. 9-17. W. J. F. *65. (The actual spot was very near indeed to the watershed which divides V.C. 64 from 65.).

Chrysomela graminis L. Extremely abundant on Tansy in Clifton Ings, York, on June 12th, 1917. W. J. F. This locality is an old and well known one, being mentioned by Stephens (Ill. iv., 346).

Melasoma populi L. Barmby Common, near Pocklington, on dwarf sallows. W. J. F. (There is a great resemblance, except in size, between this species and the red galls of *Nematus*, which were abundant on the sallows, and I frequently, at a distance, mistook the gall for the beetle.).

Chalcoides aurea Geoff. (*helxines* Foud.). Bramhope, 6-17. J. D. F.

Chalcoides fulvicornis F. (*smaragdina* Foud.). Collingham, 5-16. J. D. F. *64.

Bruchidius cisti F. (*villosus* F.). Collingham, 6-16. E. C. H.

Spermophagus pectoralis Shp. Middlesbrough, July. M.L.T. An American species, no doubt imported with merchandise.

Sitones humeralis Steph. Bramhope, 6-17. C. W. Horrell. *64.

Barynotus squamosus Germ. ab. *Schonherri* Zett. Wilberlee, Slaithwaite, 7-17, in cut docks. W. Falconer. *63. Malham, 6-17. J. W. C. *64.

Phytonomus pedestris Pk. (*suspiciosus* Hbst.). Bramhope, 6-17. C. W. Horrell. *64.

Limobius borealis Pk. (*dissimilis* Hbst.). Collingham, 6-17. C. W. Horrell.

Grypidius equiseti F. Bramhope, 6-17, C. W. H. Adel, 5-17. J. D. F. *64.

Cryptorhynchus lapathi L. North Duffield Ings, 6-17. W. J. F. *61.

Cœliodes rubicundus Hbst. Collingham, 6-16. E. C. H.

Ceuthorrhynchus crysimi F. var. †*chloropterus* Steph. Roundhay Park, 6-16. J. D. F.

†*Ceuthorrhynchus roberti* Gyll ab. *alliariæ* Bris. Collingham, 6-16. E. C. H.

Limnobaris T. album L. Martin Beck Wood. H. H. C.

Cionus pulchellus Hbst. Lister Park, Manningham, 7-17, in thousands on *Scrophularia nodosa*, which for several consecutive years has been inhabited by *Cionus scrophulariæ*. The latter insect has disappeared and *pulchellus* has taken its place. J. W. C. *63.

Magdalis ruficornis L. (*pruni* L.). Collingham, 6-16. E. C. H.

Apion ononicola Bach. (*bohemani* Th.). Aberford, 6-17. J. D. F. South Milford, 9-16, J. D. F. Boston Spa. 6-17, J. D. F. Collingham, 5-17. C. W. Horrell. *64,

Apion vicinum Kirb. Collingham. C. W. Horrell, 5-17. (Found by Walton in Yorks.—Fowler Brit., Col. v., 156.)

Apion gyllenhali Kirb. Collingham, 5-17. C. W. Horrell.' *64.

Apion platalea Germ. Collingham, 6-16. J. D. F. *64.

Rhynchites harwoodi Joy. Adel, 6-16. E. C. H. *64.

Rhynchites nanus Pk. Martin Beck Wood. By sweeping birch. H. H. C.

Rhynchites mannerheimi Hum. (*megacephalus* Germ.). Martin Beck Wood. By sweeping birch. H. H. C.

Attelabus nitens Scop. (*curculionoides* L.). Martin Beck Wood. H. H. C.

Rhinomacer attelaboides F. On Scotch fir, Kildale. June. M. L. T.

Xyloterus (*Trypodendron*) *domesticus* L. Howden, 6-17. W. J. F. *61.

Anoncodes (*Nacerdes*) *melanura* L. Warrenby, Teesmouth, 7-17, in drift wood. W. J. F.

†*Lissodema cursor* Gyll. West Garforth, 9-16. J. D. F.

Meloe proscarabæus L. Adel, 4-17. Very abundant. J.D.F.

Meloe violaceus Marsh. Collingham, 5-17. E. C. H.

†*Anaspis pulicaria* Costa. Collingham, 6-16. E. C. H.

Lagria hirta L. Barmby Common, 7-17. W. J. F. *61.

Gonodera (*Cistela*) *murina* L. Boston Spa, 6-17. J. D. F.

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The *Journal of the Quekett Microscopical Club*, No. 81, contains some interesting notes on Collecting and Mounting Rotifera, by C. F. Rousselet.

In the *Transactions of the Geological Society of Glasgow*, Vol. XVI., pt. II., Dr. F. A. Bather, has papers on '*Hydreionocrinus verrucosus*, n.sp. Carboniferous, Isle of Man,' and 'Some British Specimens of *Ulocrinus*,' in which latter he describes examples from Yorkshire, Derbyshire, etc.

1918 April 1.

FIELD NOTES.

Magpie Flocks.—In *The Naturalist*, p. 26, Mr. Riley Fortune records a large flock of Magpies, mentioning that ' it has not been given to many to see so large a flock,' and after watching these birds in several counties, Yorkshire, Cheshire, Hereford, Devon, Hertfordshire and Kent among them, and wide apart geographically, and only come across one large flock, the truth of the above-quoted statement of Mr. Fortune seems undeniable. It would be of interest to know whether there was any apparent reason for the collecting together of the thirty-two birds, in Mr. Fortune's friend's case, since Magpies usually wander about in pairs (*i.e.*, according to my experiences, except once). The reason I suggest it was probably *not* an accidental meeting is, firstly, because when staying each year at Mottram in Cheshire, an old gamekeeper told me that Magpies would collect to ' pitch into the wild cats ' if they got one in a hedge, or some place where escape was difficult ; but whether what he called ' wild cat ' was a Polecat or only a feral domestic cat, I never discovered for certainty. As Polecats were rare in those woods, whereas feral domestic cats roamed and hunted for some years about that time (1890 to 1902) to my knowledge, probably it was the latter. It certainly was not the true Wild Cat, none of which occurred there.

In any case, the only large flock of Magpies I ever saw seemed to have collected because they had some living creature ' at bay,' this being in Devonshire during August, 1892, at a part about four miles from Devonport. They were collected on a hedge, within a length of ten or twelve yards from one end of the flock to the other, chattering excitedly, with a few birds on the ground, and all appeared excited about something in the hedge, judging by the way the flock kept moving and individuals kept changing positions up and down the hedge, and the large amount of noise, flapping of wings, etc. As individuals kept moving from one part and side of the hedge to another, it was impossible to count them correctly, but the nearest estimate of the number would be, I should say, about twenty-five. As they were well away from the road, and I had shortly before had a serious disagreement with a gamekeeper about trespassing after butterflies, I did not care to investigate matters too closely, but it seems most likely they were attracted by a domestic cat ' at bay ' in the hedge. Was there any reason in the case quoted by Mr. Fortune? *— FRED D. WELCH, M.R.C.S., L.R.C.P., Hartley, near Longfield, Kent.

* Possibly they were attracted by some food, probably carrion. This is more likely than that such a number should gather together to attack a cat. Magpies are exceedingly plentiful on the outskirts of some of our large Yorkshire towns ; they find secure nesting places, undisturbed by the presence of gamekeepers and other destructive agents.—R.F.

VERTEBRATE ZOOLOGY IN YORKSHIRE.

MEMBERS of the Vertebrate Zoology section of the Yorkshire Naturalists' Union held a meeting at the Church Institute, Bradford, on February 16th, and the attendance justified the change of meeting place from Leeds to Bradford. Mr. A. Haigh-Lumby presided.

There was a generous response to the appeal for exhibits, those of Yorkshire interest being a Ruff brought by Mr. Pollard, killed from a flock of six at Ardsley, near Wakefield, September 25th, 1917 ; and a Viper, on behalf of Mr. Ashwell, obtained between Whitby and Scarborough.

Mr. Booth focussed attention on the unusual scarcity of fieldfares and redwings this winter, his experience of failing to find a single one of the former and but a few of the latter in his district being confirmed by observers in other parts. Though most species are less plentiful as a result of last year's extraordinary spell of severe weather, its effect on these two Norwegian breeding birds was particularly pronounced.

Mr. Rosse Butterfield reported that on the previous day he had observed a party of waders which he believed to be Bar Tailed Godwits on submerged low lying ground in the Keighley district. He also recorded a Goosander shot at Silsden.

In a paper on ' Colloquial Names of Yorkshire Birds,' Mr. Butterfield maintained that scientific names, although indispensable, are of little interest in comparison with colloquial names, which are of ancient origin and historical value. With the spread of education and the tendency for unification of language, these names were rapidly being displaced, and it seemed worth while to put as many as possible on record, not adapted to modern spelling, but imitating as nearly as possible the spoken sounds. He inclined to the idea that the majority of these names were introduced by our Teutonic ancestors, and possibly some were of Celtic origin. Others were undoubtedly of French origin, especially those connected with the sport of hawking. Mr. Butterfield gave several examples of these names, many of which are permanently recorded in the Union's publication on the county avi-fauna. Altogether he suggested that it was a subject worthy of being treated by a scholar of deep and wide knowledge, with an unprejudiced mind and an acute sense of judgement.

Mr. William Hewett, in some notes from the York district, gave the following as the dates when spring migrants were first observed :—

House Martin ...	April	19	Willow Wren ...	April	30
Chiffchaff	,,	24	Swift	May	5
Swallow	,,	24	Landrail (heard) ...	,,	10
Whitethroat ...	,,	24	Turtle dove ...	,,	12
Cuckoo	,,	30	Nightjar	,,	12

With the exception of Rook and Heron all the species were late in nesting. The Turtle dove seemed to be increasing as a nester. Among numerous ducks shot on the Derwent during the frost were the Tufted, Pochard, Wigeon, and female and young Smews. A pair of wild swans was seen on Wheldrake's Ings and an Egyptian Goose was shot at Sutton on Derwent. Partridges were fairly common in the neighbourhood of York and Woodcocks were increasing as residents, about ten pairs now nesting in one wood. He was informed by John Hodgson that no eggs had been seen on the Bempton Cliffs up to May 11th, 1917, and the season had been a poor one. A double-yoked Guillemot's egg obtained last season from these cliffs weighed 5¾ ozs., 70 grains.

In some notes from Wakefield district, covering a period from 1906 to the present, Mr. H. Pollard, M.R.C.V.S., recorded from personal observation, the Black Tern, Bittern, Black Throated Diver, Green Sandpiper, Sanderling, Wigeon, Shoveller, Pochard, Pintail, Ring Plover, Sheldrake, Great Crested Grebe, Little Auk. He also alluded to some unusually long strides of a rabbit on January 16th, over a field coated with snow.

The first jump or two were short, the next six feet, a shorter one, six feet again, another short one, then 9 ft., 6 ft., 9 ft., and 6 ft. in succession, and where the ground declined, 12 ft., with finally two or three short jumps to the hedge. The measurements were taken between the prints of each fore feet.

Mr. William Hewett contributed Notes on the Cuckoo, and said that Mr. Massey, Manchester, who possessed an unrivalled collection of the eggs of the Cuckoo and those of its 'foster parents,' disputed Mr. Howard Saunders' statement that one Cuckoo sometimes deposits two and even three eggs in the same nest, holding that where there were two or more Cuckoo eggs in any nest they were deposited by different birds. From the same informant he had it that the eggs of this species varied from 19.5 to 24.5 millimetres in length and from 14.5 to 18.75 in breadth. Mr. Hewett stated that he both heard and saw a bird on two occasions on April 5th, 1894, for the first time that year, as he was crossing Strensall Common, and was within a few yards of it on the second occasion. This is an unusually early date, and much before the average. Suspected Cuckoo's eggs, a German collector had discovered, were best tested by their weight, the empty shells weighing from 25 to 30 per cent. more than those of similar size laid by any other passerine bird.

Maps and views of the Crosshills district, selected for one of the Union's excursions during the summer, brought by Mr. J. Holmes, were screened, revealing many of the beauty-spots to be investigated. These were supplemented by descriptive notes, and a few pictorial examples of the fauna.

Mr. Booth contributed a talk on 'Seals,' illustrated by beautiful photographic slides, the work of Mr. Fortune. Of the five species, ringed, harp, hooded, common and grey, he regarded the two latter only as being positively British. As both were grey, it was unfortunate that name should be applied to one. But there were great differences between the two, the common seldom attaining a length of 5 ft. whilst the so-called Grey approached 11 and 12 ft. Consequently size was always a safe guide to identification. He referred to the differences already described in *The Naturalist* (March, p. 111). Mr. Booth also made comparisons between seals and sea lions, and pointed out in a wealth of other information that the seals were specialised in greater degree for an aquatic life than were the sea lions.

Mr. Jasper Atkinson exhibited a number of slides of birds of the wading orders, most of which were from his own photographs, secured in Holland and in various parts of England. He supplemented these by appropriate remarks of habitat and habit, and read a printed article of Mr. Fortune's on 'The Roseate Tern,' which he was able to illustrate by his own work. Mentioning the suspected nesting of the Little Ringed Plover at Ravenglass he urged that it would be extremely interesting to obtain proof of the breeding of this form at a station so far north.

A hearty vote of thanks was passed to all contributing and the president and secretary were empowered, if circumstances permit, to arrange for the usual meeting next November, the place being left open.

W. GREAVES.

——: o :——

Reported Nesting of the Stonechat in Upper Wharfedale.—Mr. D. Sutcliffe informs me that the young Stonechats were not *in the nest*, as I stated in my West Riding Vertebrate Zoology Report for 1917 (ante, p. 35). What he saw on July 23rd or 24th, 1917 (not on July 16th), near to the lime works at Threshfield, was an adult pair of Stonechats and three or four young birds; which appeared to be a family party.—H. B. Booth, Ben Rhydding.

A YEAR'S WORK AT THE SCUNTHORPE MUSEUM.

HAROLD E. DUDLEY, Hon. Curator.

At a recent meeting of the Scunthorpe Museum Committee, the following Report on the work during the year 1917 was submitted :—

The number of persons visiting the Museum has greatly increased, and the Hon. Curator has received many expressions of appreciation and encouragement from Councillors and the public generally. The Museum is visited by considerable numbers of young people, who appear to examine the specimens with much intelligent interest. The information thus gained by the local scholars will be helpful to them in the lessons on Nature Study and kindred subjects which are given them at the Schools. The Museum is thus vindicating its existence as an educational asset to the district.

A great handicap under which the Museum is suffering is the lack of room. Many specimens have had to be stored away, particularly in the Geological section, and it is to be hoped that it may be possible ere long to provide more space for properly displaying them. The large wall-cases, which were built to contain books, are in many ways unsuitable for Museum purposes. An attempt was made some time ago to render them more dust-proof, but with only partial success, as the specimens and labels become covered with dust in a few months, necessitating a 'Spring' cleaning at least twice a year. With the provision of proper accommodation and cases, this unnecessary work will disappear. The whole of the collections have recently been rearranged.

Much kindly and valuable help has been received from the Advisory Curator, Mr. T. Sheppard, M.Sc., F.G.S., etc., of the Hull Museums, who, in spite of the numberless calls upon his time, is always ready to give advice and assistance.

The additions during the year, although not very numerous in some sections, have nevertheless been satisfactory, in view of the fact that people generally are so busily engaged in connection with the War.

Stone Implements.—The additions under this head, which are few, include half a stone hammer, of fine grained sandstone, found on Risby Warren, by Mr. G. Dent, also several hammer stones from the same locality.

Bronze Implements.—An addition of considerable value and interest has been made, in the shape of two bronze axe-heads, part of a hoard found at Winteringham. These were obtained from the Hull Municipal Museum in exchange for a bronze socketted dagger* found and presented by Mr. F. C. Bradley. The axe heads in question, which are good specimens of Bronze Age implements, are being figured in a publication on Bronze Implements by the British Association. Through the kindness of Mr. T. Sheppard, a cast of the dagger referred to has been placed in the Museum.

Roman Remains.—Many visits have been made by the Curator to a site of Roman occupation in the neighbourhood, with the result that considerable numbers of objects of Roman origin have been added to the Museum. The chief of these is a large earthenware jar of barrel shape, 18 in. high by about 18 in. in diameter at its largest circumference. It was found *in situ* about 3 feet 6 inches from the surface, the mouth and shoulders having fallen inside the jar. The base is missing, which fact leads to the supposition that it was used for child burial.

Several portions of stone querns (hand mills used for grinding corn) have been secured from the same site. One of the specimens now in the Museum comprises half of an upper stone neatly and symmetrically made.

Large numbers of fragments of Roman pottery have been obtained,

* See *The Naturalist*, 1917, p. 281.

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which give a most interesting idea as to the shapes and sizes of the domestic utensils in use during the Roman occupation of this country. They include pieces of 'Samian' ware, 'Castor' ware, basins, dishes, cinerary urns, spindle whorls, roofing tiles, etc. Especially interesting are the remains of Mortaria, *i.e.*, earthenware vessels used for grinding food, etc. They were shallow, circular basins, lined with fragments of flint or other hard stone to facilitate grinding, and possessed a spout or lip for pouring out the material when ground.

Several other miscellaneous objects have also been turned up, including an earthenware loom-weight and cakes of lead. There are prospects of other numerous additions from this site during the coming year.

'Bygones.'—A commencement has been made towards forming a small collection of 'Bygones,' consisting of objects now practically obsolete, but which were formerly used in the household or business life of the people, such as tinder-lighters, candle-snuffers, rush-lights, horn lanterns, flails, etc. Already many specimens have been secured, including a set of brass guinea-scales and weights, a hand-loom shuttle, candle snuffers and snuffing tray, gophering iron, hand mangle, and oval boxes of early Congreve matches. This section of the Museum has proved of much interest and the curator would be glad to hear of any other suitable articles.

War Relics.—This branch develops only very slowly, but few specimens having been secured of late. Chief amongst them is a Gas Helmet from a German Officer's dug-out, lent by Lieut. G. A. Gibson, R.E. Additions would be welcomed.

Coins.—Under this head are several additions. We have received from the Hull Museum, by exchange, a fine seventeenth century Lincoln Tradesman's Token, 'Edward Tomson in the Bale of Lincoln,' ¼d. There have also been added, amongst others, a forged Lincoln shilling token, two replicas of the German 'Lusitania' medal, and sundry British, Colonial and Foreign coins and tokens.

Natural History.—This branch of the Museum's work is being extended in a small way, seven cases of local birds and mammals having been added during the past few months. They include :—Common Snipe, Jack Snipe, Woodcock, Sparrow Hawk, Long-eared Owl, Short-eared Owl, Barn Owl, Squirrel. Other specimens are in the hands of the taxidermist.

The new cases are all based on a standard size, so that they may be systematically built up as fresh ones are added. Thus, two small cases are equal in size to one large one, and so one. This will avoid a lot of trouble and unsightliness in the future.

Owing to the large extensions of the works and the cutting down of much timber in the neighbourhood, our local birds and mammals are in danger of becoming almost extinct during the next few years. It is therefore the duty of the Museums Committee to see that as many local specimens as possible are placed in the Museum. The cost of properly preserving and casing these is really very small, especially when compared with the importance of keeping these local records in the Town's Museum. The Museum will fail in one of the chief parts of its work if it allows the district to become denuded of wild life without building up a representative collection whilst it has the opportunity.

Mr. Joseph Fletcher has presented a case containing numerous Butterflies and Moths, and various other objects have also been secured.

Geology.—Many fossils have been obtained from the Frodingham Ironstone, but lack of shelf space forbids their exhibition at present. An extensive series of fossils has been secured from the strata below the Ironstone, *i.e.*, the clays and shales exposed in the Frodingham railway cutting. It is hoped that the classification of these specimens may be completed at an early date, when it is anticipated that the records will be published in *The Naturalist*. Lack of space again prohibits their exhibition. Fossils have also been added from the local 'Pecten' bed of Ironstone and from the Lower Lias Clay.

REVIEWS AND BOOK NOTICES.

The Wonders of Instinct: Chapters in the Psychology of Insects, by **J. H. Fabre.** London: T. Fisher Unwin, 320 pp., 10/6 net. All English-speaking naturalists will thank the publishers for producing this volume by 'The Poet of Science' as Fabre has quite properly been called. The book contains the most striking chapters in the author's well-known 'Souvenirs Entomologiques.' There are no scientific classifications, no lists of species nor details of geographical distribution, but, instead, a beautifully written narrative of observations made in reference to the ways of different species of insects. The various experiments, remarkable alike for their simplicity and for the valuable results obtained—are described in a style which places Fabre far ahead of any of his contemporaries or successors. Among the fourteen fascinating chapters it is difficult to say which appeal the most, though perhaps those dealing with the author's experiments with dead moles and burying beetles have the greatest 'grip' on the reader. Spiders, Glow-worms, the Cabbage Caterpillar, the Green Grasshopper and even the Bluebottle are made to instruct and entertain us. This is certainly an ideal book for any reader, and a necesary book for the naturalist, but we must warn our readers not to take it up if they are very busy, or the inevitable result will be that work will wait.

Geology. by **A. R. Dwerryhouse, D.Sc., etc.** T. Nelson & Sons, 301 pp., 3/6 net. This remarkably cheap volume is one of the 'Romance of Reality' series commenced by Messrs. Jack before the firm was taken over by Messrs. Nelson. Dr. Dwerryhouse is well known to our readers; and in this book, after deploring the fact that 'most people are content to go on living in this world without attempting to find out anything about the world itself,' he gives four chapters on the Earth and its Early History, the Atmosphere, the Hydrosphere, and the Lithosphere. These contain a useful summary of geology. The remaining fourteen chapters have the general heading 'A Geological Reconnaissance.' In these the author invents a country 'Geologica' which he explores—dealing in turn with the coast, rivers, mountains, lakes, volcanoes, hot springs, valleys, glaciers, minerals, etc. In this way Hutton River, Lyell, Coal Hill and many other places bearing names familiar to geologists, are visited, and in imagination, the country is thoroughly explored, mapped, examined for minerals and ores. Almost everything that a geologist could wish for occurs in 'Geologica'; plans and sections are also given, as well as photographs of typical Geologica-al scenery, which, in many cases, bear a striking resemblance to geological scenery in Yorkshire and other places from which Dr. Dwerryhouse no doubt obtained 'colour' for his story.

Modern Whaling and Bear Hunting, by **W. G. B. Murdoch.** London, Seeley, Service & Co., 320 pp., 21/- net. To most people the whaling days are past history; yet the narratives of the somewhat primitive methods of capturing our largest mammals, and the dangers attendant thereto, have always had a fascination. We had looked upon such stories as relics of the good old times, but Mr. Murdoch has produced a volume with all the charm and adventure of the old ones, relating experiences quite as weird and wonderful, with the additional advantages of more reliable scientific information, more modern appliances, and better methods of illustration. Mr. Murdoch took part as artist and historian in the expedition to the Weddell Sea in 1892-3—the first of its kind since Sir James Ross's expedition in 1842. The expedition of 1892-3 led to the development of the present large southern whale fishing industry. The book also contains an account of bear hunting in the Arctic, and catching narwhals after the old style, by harpooning from small boats. Mr. Murdoch has the style of a practised lecturer—he keeps one's interest from first to last—his descriptions are clear, and enlivened by many a good anecdote. He also tells much of great value to a naturalist, while his sketches and photographs are admirable. 'Modern Whaling and Bear Hunting' is one of the finest books we have read for some time.

NEWS FROM THE MAGAZINES, Etc.

On account of the large quantity of papers and reports in hand we are printing more than usual in the smaller type, in order to prevent delay.

The Museums Journal for March contains an account of William Bullock's London Museum.

The Annual meeting of the British Association, which was to have taken place this year at Cardiff, has been cancelled, for the second year in succession.

Mr. A. E. Trueman writes on 'The Lias of South Lincolnshire' in *The Geological Magazine* for February, and Mr. J. Wilfred Jackson writes on 'The New Brachiopod Genus, *Liothyrella*, of Thomson.'

British Birds for March contains Notes on the Kingfisher, by W. Rowan; A Note on the Nesting of the Swallow, by J. H. Owen; and Records of the Common Buzzard in Derbyshire, and of the Red Throated Diver Inland in Lincolnshire.

The *Sunderland Library Circular*, No. 61, records that important additions have been made to the collection of local Magnesian Limestone Concretions, by Dr. G. Abbott, and that the blind were the first to 'see' the 'tank' on its arrival at Sunderland.

Mr. A. H. Paterson has presented his manuscript notebooks from 1878-1916, a complete set of his published works relating to the Natural History of Norfolk, and about a thousand of his well-known cartoons of local interest, to the Norwich Public Library.

The Entomologist for February contains the following items: 'Notes on New and Little Known British Aphides,' by Fred V. Theobald; 'On a Cure for Entomological Specimens affected by Verdigris,' by W. G. Sheldon; 'Facts about *Eustroma reticulata*,' by Rev. Euston Nurse; 'The Abundance of White Butterflies in 1917,' by Robert Adkin.

In *The Entomologist's Monthly Magazine* for March, Mr. G. C. Champion writes: '*Sysciophthalmus crawshayi* Champ . . . the remarkable Curculionid described in the February number of this magazine . . . under the above name, proves to be synonymous with *Anomophthalmus insolitus* Fairm. (1884).' It is a pity this was not found out before describing the new species.

Dr. F. A. Bather, writing in *The Museums Journal*, states 'Museums, I confess, weary me. Perhaps I have seen too many. And of all kinds of Museums those devoted to Art seem least to yield the mental refreshment which it should be their first aim to offer.' We would recommend Dr. Bather to spend a few hours in the Victoria and Albert Museum and other institutions at South Kensington.

Among the contents of *Science Progress*, No. 47, in addition to the valuable reports by specialists on recent advances in science in its various sections, are the following:—The Density of Liquids, by J. Reilly; The Age and Area Law, A Fundamental Law of Geographical Distribution by James Small, The Hypopyhsis Cerebri: Its Structure and Development, by K. M. Parker, and the inevitable Pre-Palæolithic Man in England, by Mr. J. Reid Moir. Referring to the Piltdown remains, Mr. Moir considers these have been so extraordinarily misinterpreted that he feels it necessary that he should comment upon them. He informs us that as a practical flaker of flint, if he had been asked what sort of implements were used by a man having the features of the Piltdown skull he would have replied: 'The very primitive edge-trimmed flints generally known as Eoliths,' but precisely how his experience as a flint knapper enables him to define the nature of implements made by a man whose 'only remains' known consist of very fragmentary portions of skull, it is difficult to understand. We cannot find that, notwithstanding all his quotations and footnotes, Mr. Moir advances things very much, and in looking for something entirely new on the subject we think we have found it, for on page 473 we are informed that 'Piltdown is not in Asia.'

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Printed at BROWNS' SAVILE PRESS, 40, George Street, Hull, and published by A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London.
April 1st, 1918.

MAY 1918. No. 736
(No. 510 of current series.

THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY
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WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
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Prof. P. F. KENDALL, M.Sc., F.G.S., JOHN W. TAYLOR, M.Sc.,
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Smithsonian Institution
JUN 24 1920
National Museum

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Goole Scientific Society, First Report.
Huddersfield Arch. and Topog. Society. 4 Reports. (1865-1869).
Illustrated Scientific News. 1902-4. (Set).
Journ. Micrology and Nat. Hist. Mirror. 1914–
Keighley Naturalists' Society Journal. 4to. Part 1.
Lancs. and Cheshire Antiq. Soc. Vols. IV., V., VIII., XXVI.
Liverpool Geol. Association Proc. Parts 1, 3, 7, 16.
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Manchester Geol. Soc. Trans. Vols. XV., XVI., XIX.-XXIII.
Marine Biological Assoc. Journal. Vols. I.-IV.
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Naturalists' Journal. Vol. I., and part 44.
Naturalists' Record. Set.
Newbury District Field Club Transactions. Vols. III. and on.
Norfolk and Norwich Nat. Soc. Trans. Vol. IV., Pt. 3.
North Staffordshire Field Club Reports for 1869, 1871-2, 1876.
Peterborough Natural History Society. Reports, 1-8, 11-12, 14-26.
Quarterly Journal of Science. 1878-9, 1882-3, and 1885.
Reliquary (Jewitt's 8vo. Series). Vol. XXII
Reports on State of Agriculture of Counties (1790-1810).
Royal Cornwall Geological Society Trans. Vol. V. to date.
Salisbury Field Club. Transactions, Vol. II.
Scottish Naturalist. 1881-1891
Simpson's Guide to Whitby. 1st ed. [before 1881].
Smith's New Geological Atlas of England and Wales. 1819-21.
Soc of Antiquaries Proc. 1st Series, Vols. I. and II.
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The Farne Islands' Association is finding difficulty (through the scarcity of men) in getting bird-watchers this season. A sojourn of about 3 months on the islands during summer should be an excellent convalesence for many a discharged sailor or soldier.

The chief qualifications are trustworthiness and in being able to row a small boat in strong currents. Four men are required, who live in pairs on different islands, and receive fairly good pay and rations. If any of our readers, or their friends, desire to try the experiment, apply direct and at once to Mr. H. A. Paynter, the Hon. Secretary of the Association, at Freelands, Alnwick.

JUN 24 1920
National Museum

NOTES AND COMMENTS.

LAKE DISTRICT ROCKS.

At a recent meeting of the Geological Society of London, Mr. J. F. N. Green delivered a lecture on the Igneous Rocks of the Lake District. He first drew attention to some of the manuscript 6-inch maps of the Lake District, prepared nearly fifty years ago, by the Geological Survey, and pointed out that, although undoubtedly most accurate, they differed greatly in the volcanic area from his own. He suggested that the reason was that there was a fundamental difference in the classification of tuffs and lavas. A large proportion of the Lake-District rocks was brecciated, and had been supposed to be altered tuffs. With the unbrecciated rocks into which they passed they had been mapped as ashes. Several specimens and photographs were shown, indicating that the brecciation and apparent bedding were due to flow. Specimens were also shown of explosion-breccias, of the normal tuffs (which the lecturer believed to be mainly the result of erosion between eruptions), and of rocks simulating true tuffs, but actually sandstones and conglomerates, composed of detrital igneous material. Attention was drawn to the criteria for distinguishing the various types. Recently, manuscripts had been found in the possession of the Geological Survey proving that Aveline, whose maps were extraordinarily accurate and detailed, had anticipated by thirty years the lecturer's separation from the volcanic rocks of the basal beds of the Coniston Limestone Series.

VULCANICITY.

When re-mapped on this basis, the Borrowdale Series appeared as a simple and regular sequence, strongly folded and cropping out in long bands. An interesting history of Vulcanity was revealed, beginning in many places with explosion-tuffs followed by a great series of pyroxene-andesites over the whole district. Then there was a pause during which fine-grained andesite-tuffs, with a tendency to produce true slates, accumulated. This was succeeded by a vast outpouring of andesites, of great thickness in the central mountain region, but dying out southwards and eastwards. Next a series of peculiar mixed tuffs, of special value in mapping, was covered by another mass of andesites dying out south-westwards. After this, soda-rhyolites covered the whole district, nothing later being preserved—with one possible known exception. These volcanic rocks were intersected by a varied series of intrusions.

PROF. W. BOYD DAWKINS.

In presenting the Prestwich Medal, awarded to Prof. W. Boyd Dawkins, at the anniversary meeting of the Geological Society of London, the President stated: 'During fifty-six years Prof. Dawkins has contributed nearly thirty papers to

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the Quarterly Journal of this Society, in addition to numerous works published elsewhere. His researches in British cave-deposits and in mammalian palæontology have long been well known and highly valued. He has shown that mammalian remains can be used in the classification of the Tertiary strata, and in many ways has cast light upon some interesting chapters in the later geological history of Europe. In another direction he has made important additions to our knowledge of the geology of the Isle of Man. His long connexion with the Victoria University and the support which he has given to the Manchester Geological Society have done much to promote the study of geology in Lancashire, and his well-known publications "Cave Hunting" and "Early Man in Britain" met the needs of a wide circle of readers. Even more, perhaps, will the name of Prof. Dawkins be always associated with the discovery of the Kentish Coalfield, in which he guided to a successful issue an enterprise that had already exercised the mind of Prestwich himself. The site of the boring at Dover was selected after a careful survey of the district, and much patient labour was expended on the examination of the cores and the identification by their fossils of the several geological horizons pierced. Apart from the material success realized, there was in this way accumulated a body of information, which has important applications to the stratigraphy and tectonics of South-Eastern England.'

DR. A. HARKER'S ADDRESS.

At the same meeting the President, Dr. Harker, in his address, discussed the present position and outlook of the study of metamorphism. The rapid development of physical chemistry and the successful application of experimental methods to petrological questions have greatly changed the situation during recent years, and for the first time it seems possible to approach the subject of metamorphism systematically from the genetic standpoint. For the geologist this implies the critical study, not only of the great tracts of crystalline schists and gneisses, but equally of metamorphic aureoles, of pneumatolysis and other contact-effects, and of the phenomena, mechanical and mineralogical, related to faults and overthrusts. It implies, moreover, the recognition that these are all parts of one general problem, that of the reconstruction of rocks under varying conditions of temperature and stress. In practice, this problem is complicated by the fact that perfect adjustment of chemical equilibrium cannot be assumed, either in the rocks prior to metamorphism, or during the process of metamorphism itself.

RECRYSTALLIZATION IN A SOLID ENVIRONMENT.

Some consideration was devoted to the solvents which play an essential part in metamorphism and to the limits of migra-

tion of dissolved material within a rock-mass. The Address proceeded to the discussion of what is the most fundamental characteristic of metamorphism : namely, that recrystallization takes place in a solid environment, and so may be profoundly affected by the existence of shearing stress. Stress of this type, on the one hand, arises from the crystal growth itself, and on the other hand is called into play by external forces. The automatic adjustment of the internally created stress to neutralize that provoked from without affords the key to all structures of the nature of foliation. The mineralogical peculiarities characteristic of the crystalline schists must find their explanation in kindred considerations ; for it can be shown that the chemistry of bodies under shearing stress differs in important respects from the chemistry of unstressed bodies. The result is seen in the appearance of a certain class of ' stress-minerals ' where the dynamic element has figured largely in metamorphism, while in the same circumstances the formation of minerals of another class seems to have been inhibited. But, while some of the general principles governing the effects can be formulated, the explanation on these lines of the observed associations of minerals is a task for the future. It may be that many of the particular problems involved will in time be brought within the scope of laboratory experiment.

CONDITIONS GOVERNING METAMORPHISM.

The conditions governing metamorphism are temperature and shearing stress, with uniform pressure as a factor of less general importance. If the orogenic forces are sufficient to maintain shearing stress everywhere at its maximum, the stress itself becomes a function of temperature, since this determines the elastic limit, and the principal conditions of metamorphism come to depend upon a single variable. This degree of simplification, however, is not to be expected universally. One disturbing factor is the local rise of temperature sometimes caused by the mechanical generation of heat in the crushing of rock-masses.

ANOPHELINES.

Referring to the note in *The Naturalist* for November last, page 339, a further circular has now been issued by Mr. D. J. Grove, c/o Medical Officer, Local Government Board, Whitehall, S.W. 1., in which he states that *anopheline* mosquitos may be distinguished from *culicines* by the following characters :— (*a*) *The attitude* : An *anopheline* mosquito resting on a wall, holds itself so that its body (which forms almost a straight line with the head and proboscis) projects so as to form a distinct angle with the substratum. In the case of the *culicine* mosquito, the body (which is hump-backed in appearance) is held parallel to the supporting surface. (*b*) *The length of the palpi*

in the female: The palpi of male mosquitos both *anopheline* and *culicine* are long and furnished with long hairs which together with the plumose antennæ give the head of the male mosquito a feathery appearance. The palpi in the female *anopheline* are simple slender rod-like structures and are *as long as* the proboscis whilst in the female *culicine* they are short, insignificant appendages. There are three species of anophelines found in the British Isles, viz., *A. maculipennis*, *A. bifurcatus* and *A. plumbeus* (*nigripes*). Copies of a circular giving details of the various species may be had free from Mr. Grove, who asks for the help of our readers in the investigations.

DR. WILLIAM G. SMITH.

We are pleased to learn that Dr. William G. Smith, B.Sc., Lecturer in Botany in the East of Scotland Agricultural College, has accepted the presidency of the Yorkshire Naturalists' Union for 1919. Dr. Smith is a native of Dundee, and after taking his B.Sc. degree at St. Andrew's University, went to Munich to study plant diseases under Hartig and Tubeuf. Here he made investigations on the deformation of stems and leaves caused by species of *Exoascus*, and in 1894 obtained the degree of Ph.D. A year or two later he was appointed head of the Botanical Department at the University of Leeds, where he remained 10 years, during which time he was an active member of the Yorkshire Naturalists' Union, and not only did much to develop the department under his charge, but by his hard work and enthusiasm made a lasting impression on all who came under his influence. Soon after coming to Leeds, his brother, Robert Smith, died, ending a career of exceptional promise. Bringing to this country the inspiration of Prof. Flabault of Montpellier, under whom he studied, Robert Smith commenced a Botanical Survey of the Edinburgh District and Northern Perthshire, and in 1900 published the first maps of British Vegetation. Dr. Smith, recognising the importance of this work, at once took it up, and commenced studies on similar lines in West Yorkshire, and Vegetation Maps and memoirs dealing with these areas, were prepared in co-operation with his students C. E. Moss and W. M. Rankin. These publications served to firmly establish the Study Ecology in this country, and at a little meeting attended by four botanists at the house of Dr. Smith, the British Vegetation Committee was founded, which, after many years of active work, developed into the present British Ecological Society, whose Journal is the leading publication in this branch of Botany. For several years Dr. Smith acted as Secretary and did much to secure the success of the Society, and last year he was elected its President. The Executive of the Union has made a wise and popular choice, for Dr. Smith has not only made many important contributions

to our knowledge of British Vegetation, but has given a new outlook and a renewed incentive to outdoor work.

PALMAM QUI MERUIT FERAT.

Salix caprea.

False 'palm'! but what matters the name
When the wand that we bear in our hand
Is jewelled with topazes, lambent with flame,
And the symbol we all understand?

This year on your sabbath you failed:
Both sun and your bees were a-shroud;
But now with each tassel unscaled
They have come to your call in a cloud!

Now by day a fair buzz-tree you make!
And by beam of a moon that is 'new,'
A glamoursome, luminous brake,
Moths better than I know it's you!

May-day, 1917. F. ARNOLD LEES.

——: o :——

NORTHERN BREEDING SITES OF GULLS.

THE paper in the *Journal of the Board of Agriculture* on 'Wild Birds' Eggs' was submitted to the authorities of the British Museum for correction and revision before publication. Unfortunately the standard of accuracy is what one might have expected from the Ornithological Department of the British Museum, and as you have quoted some passages relating to the Northern counties, it is perhaps best to correct some of the more glaring errors at once. The statements that 'probably every seaboard county of England and Wales except Suffolk, has gulleries, but of the inland counties it is believed that there is a gullery only in Staffordshire' are both erroneous. The two Staffordshire gulleries referred to (Norbury and Aqualate Mere) were alternative sites occupied by the same colony, but as no birds have bred at either place since 1794, our food supplies are not likely to be increased from this source! This information is to be found in both of the more recent works on Staffordshire birds, McAldowies' *Birds of Staffordshire* (1893) and Masefield's paper in the *Victoria History of the County of Stafford* (1908), but apparently the researches of the British Museum authorities do not cover the last hundred and twenty years. The eggs of the Great Black-backed Gull (*L. marinus*) are not to be found in any part of England or Wales in numbers sufficient to have any value as a source of food. Under the head of Lancashire, you quote: 'Walney Island and Winmarleigh Moss' as breeding places. Winmarleigh Moss was long ago abandoned for Cockerham Moss and I believe the Gulls have ceased to breed even at the latter place for some years.

Under Lincolnshire 'Brigg and Twigmoor' are quoted. There are two colonies in Lincolnshire: neither is at Brigg, Twigmoor being about three miles distant, while Scotton Common is about ten miles away as the crow flies. While five comparatively small Yorkshire colonies are specified, only one of the many large breeding stations in Northumberland is mentioned, and only four for Cumberland.

Were it not for the fact that the general inaccuracy of the list discredits

it altogether, one would be disposed to ask for details of the colonies on the Durham Moors. Tristram in 1905 stated that there was no breeding place in the county. The statements with regard to the Southern counties are equally unreliable, and it is rather surprising that the Editors of *The Naturalist* should have thought a paper so full of misleading information worthy of quotation.—F. C. R. JOURDAIN.

We are not quire sure whether our valued contributor, who is the present editor of *British Birds*, is using his ornithological knowledge in order to teach us how to extract the contents of eggs by means of suction, or not; but we can assure him that, when quoting from the *Journal of the Board of Agriculture*, or from *British Birds*, or other publications, we are always very careful to make it clear that we merely quote; we give no guarantee as to the accuracy of the statements quoted; and we usually assume that our readers are able to see the reasons for the particular extracts we make.—ED.

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The Proceedings of the Cheltenham Natural Science Society, N.S., Vol. III., Part 3, contains the presidential address of Mr. C. I. Gardiner on 'The Natural History of Coal.' The publication is sold at one shilling.

In the *Transactions of the Devonshire Association for the Advancement of Science, etc.*, Vol. XLIX., 1917, is an interesting paper on 'Parasitical Hymenoptera: Ichneumonidæ and Braconidæ, type species in the Bignell Collection,' by T. V. Hodgson. In this Mr. Hodgson describes the Bignell Collection, which is now in the Plymouth Museum and contains specimens from various parts of the country, including Yorkshire.

The Transactions and Journal of the Eastbourne Natural History, Photographic and Literary Society, No. 19, contains papers on the Flint Nodules of Beachy Head, The Mote at Eastbourne, Natural History Legends, and other items of local interest. Referring to the New 'Geological Physics Society,' we notice that the editor considers that 'the new Society promises to be a veritable Hercules in the way of strangling the snakes of geological difficulties in its cradle.'

In *The Transactions of the London and Middlesex Archæological Society*, N.S., Vol. III., part 4, 1917, Mr. P. M. Johnston figures and describes a 'Roman Water Vessel found in Grove Lane, Camberwell, 1913,' and mentions that the 'Hull Museum has other examples' (p. 334). But the Hull examples have been figured and described as modern Egyptian, as the Camberwell example certainly is; consequently any deductions based on the evidence it gives of Roman occupation are hardly trustworthy.

The *Proceedings of the Coventry Natural History and Scientific Society* for 1917, are edited by Mr. J. H. Wheldon, and contain a record of the Society's eighth year of work, as well as an account of the summer excursions, the annual Soirée, Nature Study competitions, and summaries of the various addresses given before the Society. There are a number of illustrations from excellent photographs, one of which represents 'A Fungus (*Onygena equina*) growing on the horns of a dead Ram, found in Over Wyresdale.' This skull was presented to the British Museum where it is exhibited.

The Report of the Corresponding Societies Committee and of the Conference of Delegates, held in London last July, has been issued by the British Association (54 pp., 1/-) and contains the address of the President (Mr. John Hopkinson) on the 'Work and Aims of our Corresponding Societies'; a paper on 'Regional Surveys,' by Mr. Fagg; 'Money Scales and Weights,' by Mr. Sheppard, and one on 'The part to be played by Local Societies after the War in the Application of Science to the Needs of the Country,' by Mr. Mark Webb. There is also the usual useful index to the contents of the publications of the various Scientific Societies connected with the Association.

THE WOODLICE OF THE HULL DISTRICT.

2nd Lieut. T. STAINFORTH, E.R.R.G.A.

For some time previous to and during the early part of the present war I made systematic collections of the terrestrial isopods of the neighbourhood of Hull, and gave an account of the results in a lecture to the Hull Scientific and Field Naturalists' Club. Since then a list of Yorkshire species by Mr. F. Rhodes* has appeared, but as the present notes, confessedly incomplete, are supplementary to his interesting paper, and contain references not only to new localities, but also to four species and several varieties not included in Mr. Rhodes' list, I offer no apology in publishing them.

The British species of Woodlice are greater in number than is suspected by the casual observer, and I was surprised to find that in the city of Hull itself I had taken fourteen species, many of them in the very heart of the city. Woodlice of one kind or another are ubiquitous, and this seems somewhat remarkable since comparatively so few forms of Crustacea have successfully exchanged an aquatic for a terrestrial existence. To many species the presence of free water is a *sine qua non* for their life's conditions, others merely require damp situations, while a few species are tolerant of dry conditions. Our largest species, the common *Ligia oceanica*, in its mode of life at any rate, links the more typical marine isopods with the terrestrial forms. It is one of the most characteristic members of the littoral fauna of the Humber, and in my own experience is never found away from salt or brackish water. On the Humber shore it invariably lives near high-water mark, in such positions that it must be submerged at high water. During the present month (March), for example, I have found it common on the shore at Sunk Island living under chalk blocks upon which is a growth of *Fucus*. In a paper on 'Changes in the branchial lamellæ of *Ligia oceanica*, after prolonged immersion in fresh and salt water,' Miss Dorothy A. Stewart† gives an account of some experiments tending to prove that *Ligia* is able to withstand at least 24 hours of submergence in fresh water and for several (as many as nine) days in salt water. She found that fresh water acted much more rapidly than sea water in bringing about a fatal result, and concludes that this seems 'to indicate that *Ligia*, although it spends most time in terrestrial surroundings, possesses a considerable adaptability in regard to immersion in sea-water, which is probably indispensable in an animal

* 'The Terrestrial Isopoda (Woodlice) of Yorkshire.' *The Naturalist*, 1916, pp. 99-102, 121-123.

† *Mem. and Proc. Manch. Lit. and Phil. Soc.*, Vol. 58, Part. 1 (i), 1913-14.

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whose habitat so closely adjoins the sea.' Even such a typical terrestrial form as *Porcellio scaber* can live for some time under salt water, for Mr. R. S. Bagnall* records a colony of a form of this species living under stones in a marine pool.

As far as my own observations carry weight, a large proportion of the species found owe their distribution in the Hull area to commercial, agricultural and horticultural agencies. I have not found the following species away from the immediate vicinity of houses or gardens :—

Trichoniscus roseus.
Haplophthalmus danicus.
Porcellio lævis.
P. dilatatus.
Metoponorthus pruinosus.
Cylisticus convexus.
Armadillidium nasatum.

In the paper already referred to, Bagnall holds the opinion that four of the above species, namely, *T. roseus*, *H. danicus*, *M. pruinosus* and *C. convexus*, are truly endemic, but I should be inclined to doubt this myself, judging from my own collecting in the East Riding. It is quite probable that in the course of time introduced species will spread from the ports and other inhabited areas into the open country, and from the usual habitat of the above-named species I should believe this to be more probable than that they had migrated from the open country and found the rich soil of gardens more suited to their needs. This is a question, however, which can only be settled by more extended observations over larger areas, or better by the discovery of subfossil forms, as, for instance, in peat deposits or old lake beds.

If a careful search is made in cool greenhouses, in hothouses, and on waste ground near the docks, to the list here given will undoubtedly be added a number of species, such as *Haplophthalmus mengii*, *Trichoniscus pygmæus*, *Trichoniscoides albidus* and *Philoscia patiencei*.

The following sixteen species have been found in the East Riding, most of them in or near Hull. New records for Yorkshire are *Trichoniscus stebbingi*, *Porcellio lævis* and *P. ratkei*. Including *Porcellio ratzeburgii* which, though not included in Mr. Rhodes' Yorkshire List, is recorded for the Scarborough district by Mr. E. A. Wallis,† the total number of species recorded for Yorkshire is now 23, about 65 per cent. of the total British species.

Ligia oceanica Linné.

This fine species occurs everywhere along the Humber shore and many of its tidal affluents, as well as on the sea coast wherever the conditions are suitable. In a paper on

* 'The Woodlice (Terrestrial Isopoda) of Northumberland and Durham,' *Vale of Derwent, N.H.S. Trans*, 1913, p. 13.

† See *Ann. Rep. Scarb. Phil and Arch. Soc.* for 1909. 'Report on the Terrestrial Isopoda 1909,' pp. 23-4.

'The Marine Fauna of the Humber District and the Holderness Coast,' Mr. T. Petch, B.A., B.Sc.* says it occurs 'in all the chalk banks along the Humber.' Particularly large examples occur in crevices among piles and revetting at Saltend Common near Hull, and under chalk lumps used for repairing the banks near the same place. It is usually most abundant on the chalk cranches which jut out into the Humber mudflats as at Hessle, Paull, Cherry Cob Sands, Sunk Island, *et ceteris locis*. I have found it on the River Hull banks near Stoneferry, but the specimens were strikingly smaller in average size than those found on the more exposed shore of the estuary. It would be interesting to determine the range of this species along the tidal rivers which enter the Humber, such as the Ouse, Trent and Hull. At Saltend and nearer Hull I have often found it in company with the estuarine aquatic isopod, *Sphœroma rugicauda* Leach, reminiscent in its habit of rolling itself into a ball of its terrestrial relatives, the Armadillidia.

Trichoniscus pusillus Brandt.

This species is common everywhere in dampish places, among grass, moss, rubbish, etc., both in gardens, as in Hull, and in the open country. I have collected it in all the subdivisions of the East Riding.

Trichoniscus roseus Koch.

In Hull gardens and greenhouses this pretty pink species is common. Examples can be found under stones, pieces of wood, plant pots, etc., near the greenhouses in the Hull parks. I have also found it in garden refuse at Hessle.

Trichoniscus stebbingi Patience.

One example among hothouse refuse at Hessle.

Haplophthalmus danicus Budde-Lund.

Common in heaps of leaf mould at the Pearson Park, Hull, and in garden refuse at Cottingham.

Oniscus asellus Linné.

As commonly distributed as *Porcellio scaber*, and as common in the centre of Hull among rubbish in outhouses as in the wilder parts of the country as say Hotham Carrs or Houghton Woods. It would serve no useful purpose to enumerate localities.

Philoscia muscorum Scopoli.

A rather pretty species, variable in colour, and common everywhere in gardens, fields and woods, and invariably to be found among the refuse under hedges. It is abundant among the grass on the Sunk Island embankment. I have specimens from every part of the East Riding, including Hull.

Platyarthrus hoffmannseggii Brandt.

I have dealt with the distribution of this myrmecophile in

* *Trans. Hull Sci. and Field Naturalists' Club*, Vol. III., pp. 27-41.

a paper on ' The Guests of Yorkshire Ants'.* It is found in many places in the southern part of the riding, even in the suburbs of Hull, but has not yet, I believe, been recorded for the northern part, though doubtless it occurs there. A pale yellowish brown variety lives in the nests of *Donisthorpea flava* at Brantingham Dale. Dr. W. E. Collinge calls this variety *flavobrunnea.*

Porcellio scaber Latreille.

Common everywhere, especially under loose bark in Hull timber yards or in the country districts. Several varieties occur.

Var. *marmorata* Brandt, Houghton Woods, Weedley Springs.

Var. *flavomaculata* Collinge. Houghton Woods.

Var. *marginata* Brandt. Rowley.

Var. *rufa* Bagnall. Houghton Woods.

Porcellio laevis Latreille.

Very abundant in manure, North Street, and under bones of whale in the garden at Wilberforce House, Hull. I have also found it in garden refuse at Cottingham.

Porcellio dilatatus Brandt.

Among manure in company with the preceding, and in outhouses at Wilberforce House. Among leaf mould, Pearson Park, Hull.

Porcellio ratkei Brandt.

Cottingham Marsh. Identified by Dr. Collinge.

Metoponorthus pruinosus Brandt.

This species is almost always to be found in old straw and manure, or at the base of hay and straw stacks. Hull, Hessle, South Cave, Hornsea, Bridlington, Cottingham.

Cylisticus convexus De Geer.

In refuse and under rotting bags near the fish curing sheds, Humber shore, west of Hull ; and among straw thrown over the cliffs south of Bridlington.

Armadillidium vulgare Latreille.

Extensively distributed in the East Riding. Gardens in Hull, beech woods at South Cave, Houghton Woods, Weedley Springs, Cottingham, Boynton Woods, Bridlington, Hornsea, Hessle, Sunk Island.

Var. *variegata* Lereb.

Rowley, Brantingham Dale.

Armadillidium nasatum Budde-Lund.

I have as yet only found this species in the greenhouses at the West Park, Hull.

The specimens referred to above are in the collections at the Hull Museum.

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* See *The Naturalist,* 1915, p. 388.

THE GEOGRAPHICAL DISTRIBUTION OF THE MOTHS OF THE SUBFAMILY BISTONINAE.

J. W. HESLOP HARRISON, D.Sc.

XVII.—THE GENERA NACOPHORA (HULST), PHÆOURA (HULST), AND THYRINTEINA (MOSCHL).

Nacophora quernaria (Abbot and Smith). Distribution :—The Atlantic States.

Nacophora phigaliaria (Guen). Atlantic States.

Nacophora ypsilon (Forbes). Atlantic States.

Nacophora cupidaria (Grote). Florida.

Nacophora minima (Hulst). Colorado.

Phæoura mexicanaria (Grote). Mexico.

Thyrinteina arnobia (Cramer). Intertropical North, Central and South America.

Nacophora and its immediate allies, whilst undeniably Bistonine in all essentials, nevertheless carry what may be regarded as a distinctively Boarmiine structure in the fovea—a peculiar depression on the underside of the forewings which is very likely an alluring gland for sexual purposes. In it can be perceived a token bespeaking the *fons et origo* of the true *Boarmiinæ*, known from their wide distribution to be an enterprising assemblage of extreme age, for there is not a hole or corner of the whole globe to which it has not penetrated. Whilst many of the Bistonines give unmistakeable indications of their Boarmiine trend—as I have emphasised by terming them the Boarmioid *Bistoninæ*—none ever carried their tendencies further than certain genital structures, exhibited particularly in the valves.

Nacophora, however, combines the two features of the Boarmioid genitalia and a veritable Boarmiine foveal depression and, by so doing, puts us in possession of the necessary transition between the two subfamilies.

But the range of these equivocal genera is purely American and so, therefore, is inevitably its origin, and consequently the centre of the whole of the wide-spread *Boarmiinæ* must be localised in the New World. Still we must not bind ourselves to the idea that this *Nacophora* group is without its allies elsewhere, even if not very near ones, for in its lack of the second pair of posterior tibial spurs and its superficial—nay its more delicate characters—it approaches *Biston* as typified by the primitive *B. strataria*. Likewise, this approach is much more than coincidence, it is genetic. In spite of this, the remarkable fact emerges that, whilst *Biston* is confined to the Palæarctic and Indian regions, the *Nacophora* trio is a development of the Nearctic and Neotropical Zoogeographical

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divisions. Therefore, although disunited now, they must have been connected in the past by some common ancestral form.

In other words, in the old Tertiary continent, some long-lost insect linked them up; and this species (or it may be a group of species), under the stress of progress, has vanished irrevocably as in the case of the forms linking up the Llama and Alpaca with their old-world relatives the Camel and Dromedary.

An observation has been made in many families of plants, animals, insects and the rest, that, when identical or derived genera appear to be the common property of both subdivisions of the Holarctic Realm, the fossils almost invariably, but not always, tell us that the Palæarctic form is the older and to the general rule the present is no exception; *Biston* is the earlier genus, and this view is borne out by its non-possession of a fovea.

Nevertheless, one must lay particular stress on the remark that it is not quite universally true that the Palæarctic is the older species, genus, or family. Just as when a wave dashing on the shore recoils, so a spent impulse of a migratory host throws back a counterwave, and this is very probably what has happened to the earlier dog forms entering America; they have hurled back as a return wave, the true dogs of the genus *Canis*. Such, too, has been the fate of the first Bistonines passing into the Western Hemisphere, their backwash *via* the genus *Nacophora* has been the subfamily *Boarmiinæ*. Returning to the transition between the Bistons and the Nacophoras, from its total disappearance we must consider it to have been a creature of limited distribution in the old Northern Continent or one needing more tropical climates than the Holarctic region of to-day can offer. That the latter is the more correct view we glean from the preference all the *Nacophora* tribe display for warmer areas—as *Biston* does when it gets the chance.

After the separation and final disappearance of the link, *Nacophora*, acting under the influence of climate, worked its way southward if, indeed, a branch had not already struck out thither in the genus *Phæoura* and, moreover, other movements occurred of which more exact knowledge can be gained from the study of other groups, represented in fossiliferous deposits, which are attached to an arboreal environment like *Nacophora*.

The coincidence of the range of the subjects of our present essay and that of the Spotted *Felidæ* like the Jaguar (*Felis onca*), the Puma (*F. concolor*), Margay (*F. tigrina*), and the Ocelot (*F. pardalis*) which, like the Nacophoras, have lost the form connecting them with their Palæarctic relatives may be

utilised as the source of the required information ; not merely because of this coincidence, but because, for very diverse reasons, the movements of both groups depend on their definite attachment to the same forest-clad regions, and are thus put in motion by the same impulses.

A very slight consideration of the fossil *Felidæ* of America reveals the significant truth that, whilst in North America, deposits of lower Miocene age produce very freely the fossil remains of the primitive Felid genera *Dinictis* and *Pogonodon*, and such genera or their known descendants continue to the strata of Pleistocene times, on the contrary, in South America, the earliest *Felidæ* appear in late Pliocene or Pleistocene beds of South Brazil and the Argentine Republic in the form of the genus *Smilodon* which occurs in older Texan deposits. Here we see no uncertain indication that for countless ages access to South America from the North was barried, only to become feasible in late Pliocene times ; from this it is evident that the seismic disturbances ending in the appearance of the Isthmus of Panama were events of the Pliocene Epoch.

Organisms of widely separated affinities from the *Felidæ*, availing themselves also of the newly erected land-bridge, passed down ; amongst them was the most specialised of the *Nacophora* allies, the species *Thyrinteina arnobia*, which, like the Jaguar, has colonised and holds the whole of the Inter-tropical territories of North, Central, and South America.

(*To be continued*).

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Scarcity of Fieldfares.—Is the scarcity of these birds this winter general or local only? Can any explanation of their diminution be given? In the Colne Valley, bird observers—one at least with forty years' records,—have never before noticed such a dearth of blue-tails, as they are locally known. Only once has a meagre flight of six birds been seen where ordinarily hundreds and thousands may be met with. In the Fenay Beck Valley, also near Huddersfield, not a single example has been noted.—Wm. Falconer, Slaithwaite, March 2nd, 1918.

There is an almost complete absence of Fieldfares and Redwings in the British Isles this winter. Observers from all parts are recording this unaccountable dearth, for which it seems impossible to find an explanation. The severe weather experienced during the winter of 1916-17 can hardly have wiped them out altogether. Can it be that they have missed these islands and passed down the coast of continent? It would be interesting to learn if many have been seen in the fighting area. A small party of about fifteen fieldfares frequented the fields behind my house for a few days in November but I have neither seen nor heard of any since that month.—R.F.

ORNITHOLOGICAL OBSERVATIONS AND REFLECTIONS IN SHETLAND.

EDMUND SELOUS.

(*Continued from page 135*).

OCTOBER 18TH.—Four Whimbrels are now walking about on the wet, and, sometimes, on the dry, sand, thrusting their long bill into the former, mostly, or into any little tuft of sea-weed, lying about, which the tide has brought in. One of them seemed to extract some round-looking object from a hole (a worm-hole ?) in the wet sand, and then carefully replaced it. Then a bravo of the party drives, by turns, each of the others away, advancing upon them with head held a little down, and long bill, presented like a rapier, in spite of its scimitar curve. He makes little mincing steps—the set opening—and looks a professed duellist. The others take him at his own valuation, and retreat for the required distance—so many yards from a profit-bearing seaweed-heap, for such was the cause of aggression in the first instance, after which, as though whetted by success, the demands of the bully seemed to grow. But now it's all over, and they bathe together on the beach, in peace and friendship. At the end they give their wings a most vigorous flapping, during which they sometimes rise a foot or two into the air, and then drop back, and sometimes stand firm, all the while. Why they do not rise, when they do not, and why, when they do, they do not fly away altogether, I try in vain to imagine. No such strength—to all outward seeming, at least—is put forth when they really do fly. What is it, within the bird's volition, which either checks the efficacy of the wing-stroke, though seeming so powerful, or makes the body as lead ?

The Turnstone, 'though native here and to the manner born,' is anxious about the waves, coming carefully down on the wet surface of the rock, when one recedes from it, and running up again, out of its reach, as it comes in. Does not like the spray, thinks there should be a limit to spray. When, on the narrow-edged top of a rock, cleft in angles, like a crystal, the sea just comes over, and wets him, a little, he retreats down the safer side of it, and holds his ground ; but when, a little afterwards, a shower of this vile spray is flung broadcast, over it and him, the limit has been reached, and he flies away.

About a score of Hooded Crows—which, it would seem, are no more than a variety of our southern Carrion Crow—are gathered together, near the shores of a loch. After watching them, some time, walking about and flying here and there, I see one—they are all now on foot—give a sort of start, and as he takes wing, all the rest do too, and they fly, all together, across a corner of the small loch, to a wire fence running along

the hill-side, enclosing a sheep-park. Some old posts that once helped in the scheme, are lying about, and whilst some of the Crows perch on the ones still supporting the wires, others go to these, and I can see some pieces broken off by them. One flies, with a piece, on to one of the upright posts, and there commences to hack at it, but he is constantly overbalanced by the wind, and has to drop to the ground. Almost immediately he flies up again, and so persevering is he, that, having watched him about a dozen times, I begin to count, and, from this point, he is blown off and flies up again, thirteen times more, the last time onto the next post. I then walk up and examine the wood. It is soft and rotten, but all I can find in it are some very small maggots and the eggs of some insects, apparently. The Crows, it would seem, find these worth the trouble of getting—or did they eat the soft wood?

The Crow who first gave the start, and flew, stood last—not first—of the band, going by the direction in which all their heads were turned. He followed—did not lead—the flight, and soon got mixed up in it. He was no leader, in my opinion—I have seen no evidence of leadership in birds—but his sudden resolve to fly to the post seemed to communicate itself, instantaneously, to the rest. I counted twenty-one Crows at the posts.

As I came back over the hills, a Raven, on his silent wings of darkness, was gliding, widely, over the landscape. He never flapped them once, and never croaked, but passed like a shadow of night, upon the air, from hill-top to hill-top, over desolate places, with a lightness to which his sable plumage gave a weird, contrasting effect. Evidently he was scanning all beneath him for any windfall of offal or prey, and he looked now most impressive, seeming to brood on the landscape, to which, by his presence, a deeper gloom was imparted—for it was darkening, now, on barren moor and silent, lonely hill. There was no apparent effort, the air seemed to buoy him, as if he were but one black feather of himself, and so he gloomed and glided on, not seeming now to regard me, though generally hurrying away, with croaking note, the moment I come into view. But I had an impression of being silently taken in, by his downward glance, with every other detail, and grimly reckoned with. The Eagle himself could hardly have been more master of the air than this grim black bird,* and majesty was his, too, of a sort, not that of Jove indeed, but of Pluto's gloomy brow. This Raven was alone, but it is much more usual to see them in pairs. As in the spring, they often sit on some

* So, indeed, I thought *then*, having only once, long ago, and not very advantageously, seen Eagles, except in miserable cages. I do not endorse it now, since going to Iceland; in fact, it seems nonsense, but one should let one's impressions remain.

cliff or hill-top, from which, on your passing over any neighbouring one, they instantly descry you, and rise with a disapproving croak. After beating about, for a little, in a manner strongly expressive of a desire to be rid of you, which, without a doubt, is what they feel, they pass over the nearest elevated point, and for a long time, are not seen again. Thus it is almost impossible to surprise them. You see them just a moment after they have seen you, which, for all strategic purposes, on your part, is a moment too late. The nest is usually in the neighbourhood of where the birds—or one of them—rise, and thus, though in the spring their idea may be to distract attention from it, it is, in fact, betrayed by their action. For myself, however, I doubt if this be their motive, or, rather, the philosophy of their action, for the nest of a Raven is so huge and conspicuous that, if visible at all, it is easily seen when attention is thus directed to it. More probably it is to guard the young, who appear on the scene very early, that its owners keep this outlook, and their strategy, as in the case of birds generally—so at least I imagine—has probably no special relation to man—from whom, in early times, most birds would have been fairly secure—but rather to such predatory species, whose habits make, or once made them, an every day source of danger or annoyance. Most of these would find it difficult to contend against a pair of Ravens animated by the στοργη—to adopt (through Aristotle) Gilbert White's phraseology—so that these demonstrations would cause them immediately to take flight, in such a state of mind, and with such harassment, as would leave them scant leisure for making discoveries.

The note which I have, during this autumn visit, heard Ravens utter, is quite different from those constantly on their beaks, during the springtime, nor have they once rolled over on their backs, in aerial tumble, a fact which confirms me in the impression that this last is a nuptial antic, as the note then used is, no doubt, the love-call or love-song.

(To be continued)

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***Utricularia intermedia*, etc., near York.**—In *The Naturalist*, January, 1913, No. 672, page 19, there is a very interesting note by Mr. Arthur Bennett of Croydon on *Utricularia ochroleuca* Hartm., from Strensall Common, Yorkshire, V.C. 62, collected by the late George Stabler in 1881. I have much pleasure in recording the discovery of *Utricularia intermedia* Hayne., on Strensall Common, August, 1916, by my dear friend, Corporal Andrew Templeman (Royal Scots Greys). Mr. Bennett considers this to be a new record for Yorkshire. Mr. Templeman also found a colony of the Bee Orchis, *Ophrys apifera* Huds., on Strensall Common in July, 1916.—Henry J. Wilkinson.

REMARKS UPON 'THE POST-PLIOCENE NON-MARINE MOLLUSCA OF IRELAND.' *

J. W. TAYLOR, M.Sc.

In this paper the authors have brought together a very useful series of results, derived from the examination of numerous deposits of Post-Pliocene age, discovered in Caves, Chara-marl deposits, Kitchen-middens, etc., in various parts of Ireland. Eighty-one species of Land and Freshwater shells are listed, of which forty-five are land and thirty-six freshwater species, in addition to several marine and brackish-water species.

In addition the authors discuss at some length, certain of the problems and difficulties which are not yet entirely solved, as the origin and distribution of the Irish non-marine mollusca, remarks on some of the molluscan genera and species, nomenclature, etc., terminating the work with a tabular exposition of the geological distribution of the species and a series of seven conclusions embodying the opinions at which they have arrived on the various problems discussed.

As my work† is very frequently alluded to, criticised and dissented from in its pages, I propose to examine some of the statements and endeavour to ascertain how far the remarks made are justified by the available evidence.

The first chapter I propose to discuss is entitled ' Remarks on the Genera and Species,' etc., and under the heading of *Vitrina* Drap. the authors again revert to the consideration of *Vitrina pyrenaica* Fér., which name they illogically persist in applying to my *Vitrina hibernica* though I have shown elsewhere ‡ that they are not identical, and any attempts to confuse the crucial points of the subject are to be deplored, and I again point out that the only and final authority in this matter is Férussac's own figures, as the statement by Kennard and Woodward that Férussac did describe this species is not correct.

Also, as no figure nor any information whatever regarding the internal structure of *V. pyrenaica* Fér. has ever been published, we are in absolute ignorance thereof, and nothing can be gained by the examination of the anatomy of any specimens named *V. pyrenaica* by others, unless it can be shown that their shells strictly conform to Férussac's type figures.

The species of *Vitrina* are not well differentiated by their shells, and it is not unlikely that *Vitrinæ* have been found from time to time, which their finders have named *V. pyrenaica*, but this is of no account, unless the shells really agree with

* On 'The Post Pliocene Non-Marine Mollusca of Ireland.' A. S. Kennard and B. B. Woodward (*Proc. Geologists' Association*, 1917, Vol. XXVIII., Part 3, pp. 109-190).

† *Monograph of British Land and Fresh-water Mollusca.*

‡ *Op. cit.*, Vol. III., pp. 449, *et seq.*

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Férussac's illustrations. If the shells do thus agree, then they are not *V. hibernica*, and if they do not, the name *pyrenaica* cannot be used for such shells. If the anatomy and shells of Mr. Bowell's so-called *V. pyrenaica* agree with the anatomy and shells of *V. hibernica*, as Kennard and Woodward imply, then they are not the *V. pyrenaica* Fér., and the *V. pyrenaica* of Bowell merges into the synonymy of *V. hibernica* Taylor.

Further, Moquin-Tandon's figure of the animal does not, as stated by Kennard and Woodward, agree either with my figures or description, and in addition the confirmatory sign (!) is not used by him for the purpose erroneously stated by them, for he expressly explains that the sign is used to indicate when he has himself seen specimens from the actual authors of the various statements of localities, etc. This mark nowhere appears in his account of *V. pyrenaica*, and he gives no localities therefor, except those of Partiot and Férussac, and both lack his mark of verification.

Under the heading of *Helix aspersa*, Kennard and Woodward say 'Mr. Taylor remarks that *Helix aspersa* tends to produce a thicker shell than usual when living near the sea shore.' In reference to this, I may say that this is not, as erroneously stated by them, a personal observation, but a summary of the experience of others, and gives the station where incrassation has been observed, without prejudging the precise cause to which shell-thickening was due. The authors, however, say that 'the proximity of the sea has no direct bearing on the thickness of the shell,' though acknowledging that 'extremely heavy shells do occur near the sea,' which they ascribe to the presence of foraminiferous sand. The incrassation of the shell is, however, primarily dependent on the selective physiological action of the organs of the animal, the secretion of shell substance being a common property of the Mollusca, varying in efficiency in different species, as well as to some extent among individuals of the same species; thus *Unio margaritifer* secretes a thick and heavy calcareous shell when living in granitic streams, where lime is not plentiful and where *Limnæa* and *Ancyli* produce thin and fragile ones. Further, although we may naturally expect to find thick and heavy shells where lime is plentiful, and fragile ones where it is scarce, yet the heaviest specimen of *Helix aspersa* in my collection, which, though of ordinary size, weighs 129 grains, was found by Mr. J. Davy Dean, of the National Museum of Wales, upon Millstone-grit at Caton, Lancaster, where lime was very deficient.

For the purpose of studying Geographical Distribution, the authors divide the species into three groups: (1) a Western or ancient group; (2) a Germanic or modern group, and (3) a group of uncertain origin but probably Holarctic. The Germanic group the authors restrict to comparatively few—about

nine species—and remark that ' it would thus appear that the German species are not so dominant as Mr. Taylor has assumed.'

The Western or older group is stated to comprise ' those species which had their origin in Western Europe and have spread eastward,' and these are given as seventy-seven in number. To present date the ' Monograph ' has accurately charted and published the known range of 39 of the 77 species mentioned, and from an examination of these distributional maps, it is seen that of these thirty-nine species, only about seven can justly be called strictly Western. None of the remaining thirty-two species are really western, but preponderatingly Eastern, Northern or Southern in their tendencies.

Arion, *Limax* and *Agriolimax*, which they state have a decidedly Western distribution, do not show such a character as the published charts will demonstrate. The nine species of *Polita* are not Western, with the exception of the three species of very doubtful value created by the authors themselves. The two *Zonitoides* are also not Western, neither can *Pyramidula rotundata*, *P. rupestris*, or even *Hygromia fusca* be claimed as as predominatingly Western. *Helix nemoralis* and *H. hortensis* are certainly not Western, nor are *Helicigona lapicida* and *H. arbustorum* or *Hygromia hispida* and *H. striolata*, while *Theba cantiana*, *T. cartusiana* and *Helix pisana* are preponderatingly Southern.

None of the remaining thirty-two species are preponderatingly Western, and it is not unreasonable to suppose that the distribution of the remaining British species when accurately mapped will show similar proportional results.

The authors in treating upon the origin of the Irish Mollusca, remark that three theories have been propounded to account for their presence. The first, which the authors term the ' Edward Forbes' theory,' is the belief to which they give their support—with modifications. This theory, propounded by Prof. Forbes, was based upon a study of the Flora and Fauna and of the Palæontological evidence.

The second theory, which Kennard and Woodward have dubbed the ' Pan-Germanic theory,' is based upon the study of the Non-Marine Mollusca, and is propounded by the present writer in the ' Monograph of the Land and Freshwater Mollusca of the British Isles.'

The third theory is characterised as the ' Glacial Extermination theory,' and is based upon botanical, palæo-botanical and geological evidence, and teaches the almost total destruction of the flora and fauna by the climatal severity of the Glacial period. This theory was strongly supported by the late Clement Reid, but is rejected as quite untenable by the authors.

The second, or as the authors term it, the ' Pan-Germanic theory,' according to them, teaches that the Non-Marine Mol-

lusca of Ireland ' originated in Germany, the earlier evolved and therefore more primitive types being gradually driven farther and farther away from the evolutionary centre.' The grave misconception of those authors as shown by their arguments that *every species* is believed to arise in North-central Europe, a region by no means synonymous with Germany, as Kennard and Woodward persistently phrase it.

If Kennard and Woodward will more carefully peruse the original, they will learn that all that is claimed is, that the chief types of life originated in the North-central European region,* and that evolution in a lesser degree is a characteristic of every region,† and it is nowhere denied that species and varieties do become evolved in every country by the influence of the special organic and inorganic environment to which they are subjected.

Even Australia,‡ though so evolutionary feeble, has developed a rich variety of species, but with little or no material advance in structure. In this connection it is to be noted that even Kennard and Woodward allow that in Oligocene and Miocene times a varied Molluscan fauna existed in Western Germany and Bohemia, containing probably the ancestral forms of some of our living species and though they state that these forms have also been found in Switzerland and France, and especially in the South-west of France, they give no information as to the geological age of the deposits there.

With the view of upholding their own erroneous interpretation of my theory, the authors classify the Molluscan fauna into several groups. The first is based upon the presence of eighteen Gastropods and several Pisidia in earlier strata in this country, than in Germany. A second list shows twenty-two species now living in England which are not known in Germany, living or fossil. A third list enumerates eight species formerly resident here, quite unknown in Germany.

These lists, though not perfectly accurate, agree in the main with the present imperfect palæontological knowledge, but are published with the special purpose of showing by the evidence they offer that species have or may have originated in this country, a statement which has not been disputed.

The geological record and our knowledge of it is too fragmentary and incomplete for final conclusions, and cannot in its present stage overthrow decisions based upon the solid facts of structure and distribution by the merely negative evidence it may offer, evidence also peculiarly liable to continual alteration and correction by the results of future dis-

* Monograph, Vol. I. p. 387.
† Monograph, Vol. I., p. 401.
‡ Monograph, Vol. I., p. 388.

covery and research, and surely it is rash and quite unwarranted to claim more than tentative value for palæontological evidence, when even in the present paper, the authors assure us that they, with all the lavish assistance they have had, ' have only been able just to touch the fringe of the subject,' but when still more workers are avilable ' many more important discoveries will be made, new light will be thrown on problems at present obscure, whilst not impossibly some of our most cherished conclusions will be modified.'

In the light of the foregoing confession of our ignorance of the subject by the authors themselves, it is quite illogical to so confidently declare, as they have done, the conclusions to which they have been led.

There are many other debatable points which the limited space at my disposal will not allow me at present to touch upon, but it will be useful to reproduce some of Kennard and Woodward's declared convictions which guide them in their scientific work. In the first place, they ' entirely reject the reality of the struggle for existence,' and secondly deny the ' Dominancy or Superiority of the recently evolved or modern species over their more ancient predecessors,' and affirm that it is at variance with the facts ' that the earlier evolved and therefore weaker species have been driven away from the evolutionary centre by the later evolved or dominant species,' contending that it ' is certain that over the greater part of the British Isles, there is no competition between the various species of Mollusca,' and that it is totally at variance with ascertained geological evidence, that 'certain species have driven out others,' and that ' it does not follow that because a species is higher in the evolutionary scale, it is therefore stronger in the struggle for existence with a lower one,' giving, among other instances, that Man occasionally succumbs to Bacterial diseases.

The reality, however, of the existence of Dominancy, which is intimately bound up with the Unity of plan of Evolution, though challenged from time to time by the still numerous adherents to the more or less modified Forbesian and other theories, has never been successfully controverted, and therefore still holds the field as a very important factor in the progress and advancement of organic life and its dispersal over the globe.

May I, in conclusion, express my regret at the disingenuous spirit which has apparently animated the authors of the ' Post-Pliocene Non-Marine Mollusca of Ireland ' as shown more especially in the unwarranted use of names and terms quite out of place in a scientific discussion, and which in the present state of feeling in this country are objectionable and tend to excite a spirit of animosity which is not in the interest of friendly intercourse and therefore regrettable in its results.

1918 May 1.

PLANT GALLS OF THE HUDDERSFIELD DISTRICT.

WM. FALCONER,
Slaithwaite, Huddersfield.

THE following is a list of all the plant galls which have been found to occur, up to the present, in the Huddersfield drainage area—the basins of the Colne, Holme and Fenay Beck. Most of them have been collected since May 1917, but many were already known from the same localities to Mr. S. L. Mosley. Additional records were also obtained verbally from him or extracted from his little work 'British Galls," reprinted from *The Naturalists' Journal* in 1903, all distinguished by his initials. The journeys to Armitage Bridge and Ellen Springs were undertaken in company with him and Mr. B. Langrick, and those to lower Butternab Wood, Sun Dean and Lepton with him and two ladies. 68 kinds of galls are recorded, but their full distribution in the district still requires working out.

HYMENOPTERA.

Pontania proxima Lepel. Long leaved willows, Ellen Springs, Slaithwaite, Linthwaite; abundant and probably in other localities.

Biorhiza pallida Oliv. Holme Moss plantation, S.L.M.; Butternab Wood, on a tree near the kennels; Whitley Woods.

B. aptera Bosc. Oak roots, Lepton Great Wood.

Andricus pilosus Adlr., form *fecundator*. Holme Moss plantation, S.L.M.; Ellen Springs, Butternab Wood, several places about Slaithwaite, Drop Clough (Marsden), abundant. In Butternab Wood, several galls were still 'cone-like,' and the internal woody gall of one cut through still contained the larva in February; also in Drop Clough on March 2nd, but the inner gall was empty; Mollicar Woods, Lepton Great Wood, Whitley Woods.

A. inflator Htg. Drop Clough, Lepton Great Wood.

A. autumnalis Htg. Mollicar Woods.

A. trilineatus Htg., form *radicis* Fabr. Butternab Wood and Lepton Great Wood, S.L.M.

Neuroterus baccarum Linn. Hagg Wood, Honley, S.L.M.; Bottoms Wood, Slaithwaite, known for 13 years.

N. baccarum Linn. form *lenticularis* Oliv. Bottoms Wood, Slaithwaite, known for 18 years.

Dryaphanta taschenbergi Schl. form *folii* Linn. Holme Moss plantation, S.L.M.; Ellen Springs, Butternab Wood, Ainley Place, Holmfirth. Mr. I. Oldroyd of Scholes, an ardent fisherman, collects these galls, and fishes with the flies which breed out of them, finding them more 'killing' than any other he has used for the purpose.

Trigonaspis megaptera Panz. Huddersfield, S.L.M.

Cynips kollari Htg. Mollicar Woods, S.L.M., great tits were busily engaged in digging the galls open to devour the contained larvæ, fully three-quarters being so treated; Bottoms Wood, Slaithwaite, known for 18 years.

Andricus solitarius Fonsc. Lepton and Shrogg Lane, Kirkheaton, S.L.M.; lower Butternab Wood, Drop Clough, Cockatoo Wood, Honley.

Andricus ostreus Gir. Butternab Wood, two examples.

Andricus lucidus Htg. Whitley Woods, Huddersfield, S.L.M.

Dryophanta disticha Htg. Lower Butternab Wood, fairly numerous. Connold states 'nowhere common.'

Rhodites rosae Linn. Ellen Springs, Lepton, Ainley Place, Rowley Hill and Lepton Great Wood, Blue-tits were seen pulling the 'bedeguar' to pieces to get at the larvæ inside them.

Rhodites eglanteriae Htg. Lepton, Butternab Wood, Ainley Place, where a somewhat rough-coated variety occurs, but not at all with the long spines of *R. rosarum* Gir. Examples have been kept to see if the imago will emerge.

Xestophanes brevitarsis Thoms. Lepton, 'British Galls,' p. 23, S.L.M. Dr. Harrison appears to have overlooked this record and another in the same place (Redcar), in stating that this gall had not previously been recorded for the north of England (*Entomologist, Nov.* 1916, p. 242).

Aulacidea pilosellae Kief. One example in a field at Wilberlee, Slaithwaite, July, 1917:—lately recorded from near Leeds (*The Naturalist*, November, 1917).

DIPTERA.

Perrisia filicina Kief. Near Huddersfield, S.L.M. Ellen Springs, Sun Dean.

Perrisia marginem-torquens Winn. Common in various places about Slaithwaite and Linthwaite.

Rhabdophaga rosaria H. Low. Armitage Bridge, Dogley Mill Dam.

Massalongia rubra Kief. Sun Dean.

Oligotrophus betulae Winn. Beaumont Park, Huddersfield.

Microdiplosis volvens Kief. Thurstonland and Ellen Springs, S.L.M.; Brockholes, Butternab Wood.

Perrisia crataegi Winn. Wherever there are hawthorns—abundant.

Perrisia urticae Perr. Brockholes, Sun Dean, Almondbury, Lepton.

Perrisia persicariae Linn. Near Huddersfield, S.L.M.—Gawthorpe Mill goit.

Perrisia ulmariae Bremi. Ellen Springs, Sun Dean, Lepton.

Perrisia rosarum Hardy. Huddersfield, S.L.M., Armitage Bridge, Lepton, Ainley Place.

Perrisia anglica Kief. Syke's plantation near top of Wholestone Moor, Outlane, S.L.M.

Stictodiplosis corylina F. Low. Lepton Great Wood.

Contarinia tiliarum Kief. Lockwood, S.L.M., Slaithwaite.

Perrisia epilobii F. Löw. Beaumont Park, Huddersfield, S.L.M.

Perrisia fraxini Kief. Ellen Springs, Armitage Bridge, Sun Dean, Butternab Wood, Ainley Place.

Perrisia trachelii (?) Wachtl. A pale loose, bud-like gall near base of stem, in a field at Wilberlee, Slaithwaite.

Rhopalomyia millefolii H. Löw. Lepton, S.L.M., fields at Wilberlee, common.

Rhopalomyia ptarmicae Vallot. Near Huddersfield, S.L.M.

Urophora solstitialis Linn. Near Huddersfield, S.L.M.—Kirkheaton.

LEPIDOPTERA.

Argyresthia goedartella Linn. On alder catkins near canal, Slaithwaite.

HOMOPTERA.

Pemphigus bursarius Linn. Armitage Bridge, Ponty Gardens, Hall Ings, S.L.M., Brockholes.

P. affinis Kalt. Beaumont Park, Ponty Gardens, S.L.M.

Aphis atriplicis K. On *Atriplex patula* L., Lepton.

Rhopalosiphum ribis Linn. On black currant, Lepton.

Aphis pyri Fonsc. On crab apple, Lepton, near the Church.

Psylla crataegi Schrk. Beaumont Park, Huddersfield, S.L.M.

Psyllopsis fraxini Linn. Armitage Bridge, Sun Dean, Ainley Place, abundant.

Psylla buxi Linn. Beaumont Park, Kirkheaton.

Brachycolus stellariae Hardy. Abundant about Slaithwaite, Lepton, Almondbury, on *Agrostis tenuis* Sib.

ACARI.

Eriophyes psilaspis Nal. Fixby, S.L.M., Armitage Bridge.

Eriophyes salicis Nal. Sun Dean, Armitage Bridge (Mag Wood), Lepton, Drop Clough (Marsden).

Eriophyes rudis Can. Brockholes, solitary tree by roadside, Drop Clough, Lepton Great Wood.

Eriophyes rudis Can. var. *longiseta* Nal. Sun Dean, S.L.M.

Eriophyes (?) species. Birch trunks near the footpath, Butternab Wood—massed buds on a woody boss; some fine examples.

Eriophyes nalepai Fock. Longwood (Miss Blackburn), Ellen Springs Sun Dean, Lepton.

Eriophyes lævis Nal. Ellen Springs, S.L.M.

Eriophyes avellanae Nal. Ellen Springs, Berry Brow, Kirkheaton.

Eriophyes ribis Nal. Merridale, Slaithwaite. Mr. Mosley says it is abundant in the Huddersfield district.

Eriophyes pyri Pagenst. On blackthorn, Shrogg Lane. Kirkheaton S.L.M.; on mountain ash, Sun Dean.

Eriophyes macrorrhyncus Nal. On sycamore; Beaumont Park, Huddersfield, S.L.M.; Ellen Springs, Clough House, Slaithwaite.

Eriophyes rosae Swant. Mollicar Woods, Cockatoo Wood (Honley), Fenay Bridge, Lepton Great Wood.

Eriophyes tiliae Pagn. var. *liosoma* Nal. Bottom of Storthes Hall Lane, Kirkburton on left hand; apparently the only tree in the district so galled.

FUNGI.

Exoascus deformans Fück. Witches broom, cherry, Grimescar Wood, Whitley Woods, Birks Mill Lane (Almondbury) Storthes Hall Wood.

E. turgidus Sdbk. Witches broom, Birch; Wooldale, Storthes Hall Wood, Mollicar Wood, Lepton Great Wood; Elm; Toothill, Mollicar Wood, Lepton Great Wood.

? on oak, Witches broom, Storthes Hall Wood, Rowley Hill in a field.

Frankiella alni R. Maire. Mollicar Wood, Dogley Mill Dam, Clough House.

Undetermined Dipterous Gall: On couch grass (*Triticum repens* L.) at the top of the haulm, arresting development and bunching the leaves and spikelets. Attempts have previously been made, but without success, to discover the agent concerned. Other examples are now under observation. Lepton.

——: o :——

Agriculture and the Land, by **G. F. Bosworth.** Cambridge University Press: 93 pp., 1/6 net. The sub-title of this volume, viz., 'with some account of Building Societies, Garden Cities, Our Water Supply and Internal Communication' defines its scope. It deals with the rise and progress of Agriculture, 'our most important industry.' Several suitable illustrations add to the attractions of this readable volume.

Coleoptera Illustrata, Vol. I., No. 3 (Carabidæ), by **Howard Notman.** Brooklyn: 136 Joralemon Street (Price One Dollar). The author is to be congratulated on the third part of this publication. As in the previous numbers, the drawings are good and give in simple lines the facies of the species depicted. The fifty plates illustrate members of the genera *Abax, Amara, Anisodactylus, Anophthalmus, Bembidium, Cillenus, Elaphrus, Pterostichus, Zabrus* and some others. The species are European, including British forms.

BIBLIOGRAPHY:

Papers and Records relating to the Geology and Palæontology of the North of England (Yorkshire excepted), published during 1917.

T. SHEPPARD, M.Sc., F.G.S.

1914.

[D.] WOOLACOTT, C. T. TRECHMANN, [J. A.] SMYTHE. Northumberland, Durham.
Boulders Committee [Report of]. 'Proc. Univ. Durham Phil. Soc.,' Vol. V., Pt. 4, p. 225.

1916.

W. A. BONE. Northern Counties.
Fuel Economy from a National Standpoint [with discussion]. *Proc. Sheffield Soc. of Eng. and Metallurgists.* Part 1, pp. 3-35.

WILLIAM GEORGE FEARNSIDES. Derby, Notts., West Yorks.
Some effects of earth-movement on the Coal-Measures of the Sheffield District (South Yorkshire and the neighbouring parts of West Yorkshire, Derbyshire and Nottinghamshire). Part 1, *Trans. Inst. Min. Eng.*, Vol. L., Pt. 3, pp. 573-624 and [Vol. LI.], pt. 3, pp. 109-125 (pp. 1-69 of reprint); also Part. II., *loc. cit.*, Vol. LI., Pt. 3, pp. 409-455 (pp. 71-117 of reprint). See also *Naturalist*, 1917, pp. 178-9.

[GEORGE HICKLING]. Lancs., S.
Discussion of Dr. George Hickling's Papers on 'The Coal Measures of the Croxteth Park Inlier' and 'The Geological Structure of the South Lancashire Coalfield.' *Trans. Manch. Geol. and Min. Soc.*, Vol. XXXIV., Part 9, pp. 329-336, and Part X., p. 428.

X. STAINER. Northern Counties.
The Connexion between the North-Western European Coalfields. *Trans. Manch. Geol. and Min. Soc.*, Vol. XXXIV., Part 9, pp. 337-391. Discussion in Part 10, pp. 429-430.

1917.

ANON. Yorks., Lincs.
A Coalfield in the Fenland [notice of Prof. Fearnside's paper]. *Naturalist*, June, pp. 178-179.

ANON. Yorks., Lincs., Cumberland.
The Supply of Iron Ore [notice of Prof. Fearnside's paper]. *Naturalist*, June, p. 179.

ANON. Northern Counties.
Geological Photographs [see under W. W. Watts]. *Naturalist*, June, pp. 179-180.

ANON. Yorks., Isle of Man.
Aclisina [notice of Mrs. Longstaff's paper]. *Naturalist*, June, p. 182.

ANON. Northern Counties.
Evolution of Geological Maps; Early References to Geology; Soil Maps; The First Geological Map; Later Maps [see also under T. Sheppard]. *Naturalist*, July, pp. 213-214.

ANON. Northern Counties.
Sands for Glass Making [notice of P. G. H. Boswell's Memoir; see under Boswell, 1916]. *Naturalist*, May, p. 148.

ANON. Derbyshire.
Derbyshire Carboniferous Lavas [notice of H. C. Sargent's paper]. *Naturalist*, May, pp. 148-9.

ANON. Yorks., Northumberland.
Carboniferous Corals; Diagnoses; Discussion [E. J. Garwood] [notice of Stanley Smith's paper on *Aulinia rotiformis*, etc.]. *Naturalist*, February, pp. 51-53.

ANON. Lancs.
Facetted Pebbles from Lancashire [notice of J. W. Jackson's paper]. *Naturalist*, February, pp. 53-54. See also *Lancs. and Cheshire Nat.*, December, 1916 (published, 1917), p. 227.

ANON. Yorks., Durham, Notts., Cheshire.
Glass Sands, British and Foreign [review of P. G. H. Boswell's book]. *Quarry*, February, pp. 25-27. See also under P. G. H. Boswell, 1916.

ANON. Yorks., Lancs., Cumberland.
Richard Hill Tiddeman, M.A. (Oxon.), F.G.S., etc. Born February 11th, 1842; Died February 20th, 1917. *Geol. Mag.*, May, pp. 238-239.

ANON. Notts., Derbyshire.
Microscopic Material of the Bunter [notice of T. H. Burton's paper]. *Naturalist*, June, p. 182.

ANON. Lancs. S.
Secondary Rutile in Millstone Grit [notice of H. W. Greenwood's paper]. *Naturalist*, August, p. 244.

ANON. Northern Counties.
Eminent Living Geologists: Alfred Harker, M.A., LL.D. (McGill), F.R.S., [etc]. *Geol. Mag.*, July, pp. 289-294.

ANON. Yorks., Lincs.
The Interglacial Problem; The Kirmington Deposit; Correlation of Deposits [notice of W. B. Wright's paper]. *Naturalist*, November, pp. 345-346.

ANON. Derbyshire.
The Pliocene Cave at Dove Holes. *Geol. Mag.*, October, p. 480.

ANON. Northumberland, Lancs. S., Yorks.
Manchester Geological and Mining Society [notice of Dr. G. Hickling's paper]. *Naturalist*, December, pp. 370-371.

ANON. Lake District, Yorks.
The Ingleton Slates [notice of J. F. N. Green's paper]. *Naturalist*, Dec., p. 371.

GEORGE ABBOTT. Durham.
Forms of Weathering in Magnesian Limestone. *Nature*, February 8th, pp. 447-448.

F. A. BATHER. Isle of Man.
Hydreionocrinus verrucosus **n. sp., Carboniferous, Isle of Man.** *Trans. Geol. Soc. Glasgow*, Vol. XVI., pt. 2, pp. 203-206.

F. A. BATHER. Yorks, Derby.
Some British Specimens of *Ulocrinus*. *Trans. Geol. Soc. Glasgow*, Vol. XVI., pt. 2, pp. 207-219.

[L. L. BELINFANTE, edited by]. Northern Counties.
Abstracts of the Proceedings of the Geological Society of London, Nos. 995-1010, 101 pp.

HERBERT BOLTON. Lancs. S., Durham.
On some Insects from the British Coal Measures. *Quart. Journ. Geol. Soc.*, Vol. LXXII., Part 1, No. 285, pp. 43-62.

P. G. H. BOSWELL, GRENVILLE A. J. COLE, ARTHUR MORLEY DAVIES, CHARLES DAVISION, JOHN W. EVANS, J. WALTER GREGORY, ALFRED HARKER, OWEN THOMAS JONES, PERCY FRY KENDALL, LINSDALL RICHARDSON, WILLIAM WHITEHEAD WATTS, H. J. OSBORNE WHITE. Northern Counties.
Handbuck der regionalen Geologie. III., Band I., Abteilung, The British Isles, 20, Heft. Band III., 3, Heidelberg, 1917. 354 pp.

P. G. H. BOSWELL. Derbyshire.
Some Uses of Sands [extract from 'A Memoir on British Resources of Sands suitable for Glass making,' 1916]. *Quarry*, February, p. 40-41; see also review of the book *loc. cit.*, pp. 25-27, and *Naturalist*, May, p. 148.

P. G. H. BOSWELL. Northern Counties.
Some Geological Characters of Sands used in Glass Manufacture. *Rep. Brit. Assoc.* for 1916 (Newcastle), pp. 401-402.

P. G. H. BOSWELL. Northern Counties.
A Supplementary Memoir on British Resources of Sands and Rocks used in Glass Manufacture, with Notes on Certain Refractory Materials. With contributions by W. B. Wright, H. F. Harwood, and A. A. Eldridge. London, 92 pp. See *Nature*, January 10th, 1918, p. 368.

GRACE M. BOUER. Westmorland.
Excursion to the Lower Carboniferous Rocks of Westmorland. *Proc. Geol. Assoc.*, Vol. XXVIII., Pt. 1, pp. 44-45.

W. S. BOULTON. Northern Counties.
[**Presidential Address to Section C. (Geology)**; deals with the Development of Concealed Coalfields, Geology of Petroleum; Underground Water, etc.]. *Rep. Brit. Assoc.* for 1916 (Newcastle), pp. 378-393.

THOMAS HARRIS BURTON. Notts.
The Microscopic Material of the Bunter Pebble-Beds of Nottinghamshire and its probable source of origin. [Abstract]. *Geol. Mag.*, June, p. 288; also *Naturalist*, June, p. 182.

G. MONTAGUE BUTLER. Cumberland.
A Pocket Handbook of Minerals. 2nd edition, 311 pp.

FREDERICK J. BYWATER. Yorks., Derbyshire.
Refractory Material [reprinted from *Trans. Inst. Gas Engineers*, 1908]. *Trans. Faraday Soc.*, Vol. XII. (pp. 32-50 of reprint).

GRENVILLE A. J. COLE. See P. G. H. BOSWELL.

W. H. DALTON. Derby, Notts, Cumberland, Lancs., Yorks., Durham.
On the Oil Prospects of the British Isles. *Journ. Inst. Petrol. Technol.*, Vol. IV., pp. 37-62 [abstract in *Nature*, December 27th, p. 336].

ARTHUR MORLEY DAVIES. See P. G. H. BOSWELL.

CHARLES DAVISON. See P. G. H. BOSWELL.

R. M. DEELEY. Notts., etc.
Disturbed Gravels. *Geol. Mag.*, April, pp. 157-159.

(To be continued).

In Memoriam.

J. H. HOWARTH, J.P., F.G.S.

Yorkshire naturalists have received a further loss in the death of John Henry Howarth, at the age of 64 years. He was born at Kirkby Malham and educated at the Giggleswith Grammar School, of which he was subsequently a governor.

He was a quiet, earnest, conscientious and enthusiastic worker, and before his numerous public appointments occupied so much of his time, frequently took part in the meetings and excursions of the Yorkshire Naturalists' Union and Yorkshire Geological Society, for some years occupying the position of hon. treasurer of the former and hon. secretary of the latter. He was a valued member of the Council of these two societies, where his business ability was of great assistance. He was an admirable guide on excursions to the north-west corner of our county, the geology of which he knew thoroughly. He

took part in the investigations of the underground waters of the Ingleborough area, and was of much assistance in connection with the publication of the scientific results obtained. He was also greatly interested in the erratic boulders of the county, and for several years was the secretary of the Yorkshire Boulder Committee and compiled the annual reports ; finally summarising the whole of the Yorkshire records in a valuable paper on " The Ice-borne Boulders of Yorkshire,' which appeared in *The Naturalist* for 1908. In connection with this he prepared a large map upon which he indicated all the far-travelled boulders recorded in Yorkshire. This is now framed and hung in the Geological Gallery at the Hull Museum. In the ' Bibliography of Yorkshire Geology ' are particulars of about thirty contributions from his pen—many of which appeared in *The Naturalist* between 1894 and 1910, though the *Proceedings of the Yorkshire Geological Society*, *The Halifax Naturalist*, and the publications of the British Association, also preserve some of his scientific work.

During recent years his work as Chairman and General Manager of the West Yorkshire Bank, as a Justice of the Peace, as President and Treasurer of the Halifax Chamber of Commerce, as a prominent Churchman and Freemason, and in many other positions which he occupied, prevented him from devoting much time to scientific pursuits, and, to the regret of his fellow naturalists and geologists, his visits among them became very few, though he was always interested in their work. Many of us will miss this genial and straightforward man, and our sympathies go to his daughter, Mrs. V. W. Wanklyn.—T. S.

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We regret to hear of the death of Mr. S. Maples, President of the Spalding Gentlemen's Society.

The death is announced of Miss B. Lindsay, well known for her Zoological work in the Isle of Man and other districts.

Mrs. and Miss Holt have given £2,000 towards the equipment of the new department of Geology, at the University of Liverpool.

Some of the inhabitants of Darlington are taking steps to have a Municipal Museum for the borough as soon as the war is over.

We regret to record the death of Dr. L. Moysey of Nottingham, who was on the hospital ship ' Glenart Castle,' when torpedoed, and was not among the rescued. He was keenly interested in palæontology, and the Reports of the British Association contain details of his contributions on the subject. A few weeks before his death he had given his fossil plants to the University of Cambridge, and the fossil animal remains to the Geological Survey.

We much regret to notice the announcement of the death of George Jennings Hinde, Ph.D., F.R.S., F.G.S. Dr. Hinde was born at Norwich in 1839. He was an authority on Fossil Sponges, Radiolaria and Corals, and was the author of many papers on these subjects. In 1883 he wrote a Catalogue of Fossil Sponges in the British Museum, a large 4to volume, which contains many excellent illustrations of specimens from the Yorkshire Chalk, principally near Bridlington.

FIELD NOTES.

MOLLUSCA.

Mollusca near Louth.—Mr. C. S. Carter (see page 121, ante), will be interested to know that to Mr. V. Howard and myself *Helicigona lapicida,* var. *nigrescens* Tay., living, occurred freely in Welton-le-Marsh Wood, six miles south-east of Gt. Thoresby, on August 27th, 1907, and again in 1908 in company with living examples of *Cyclostoma elegans* var. *pallida* Moq.—J. F. Musham.

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BIRDS.

Cuckoos' Eggs and Foster Parents.—Referring to Mr. W. Hewitt's remarks (*The Naturalist,* p. 140), that Mr. Massey disputed the statements 'that one Cuckoo sometimes deposits two or three eggs in the same nest, holding that where there were two or more Cuckoo eggs in any nest they were deposited by different birds,' I cannot help thinking that Mr. Massey's contention is much too sweeping, since I have at least found one nest with two Cuckoo eggs, and, I think, there were overwhelming reasons to convince anyone that both eggs were laid by one Cuckoo.—E. P. Butterfield.

Flocks of Magpies.—Referring to *The Naturalist,* pages 26 and 138, it has been my privilege to see two flocks of Magpies, if parties of between twenty to thirty, scattered within a radius of a hundred yards or so can be called 'flocks.' I saw a flock of this kind about last Christmas in the fields within a mile of this place, but the birds appeared to be quite restless, flying from one hedge to another, without any apparent reason whatever, and left the locality altogether within quite a short time, and gave me the impression they were on migration. The other flock was on a tract of land up to the Crimean War covered with bilberry and heather, but now well under cultivation, but is still called Cottingley Moor; this flock also gave me the impression of its being a migratory movement. In neither of these flocks could it be said that with any reason food had induced them to visit the localities where I saw them. Referring to Mr. Welch's notes; some time ago, near the Allerton car terminus, near a farm house, I saw a cat, almost certainly belonging to the farm house, and two or three Magpies, having an encounter. The cat was in a big bush—either Elder or Whitethorn—but I think the Magpies were more frightened than otherwise. I have heard, however, of them—at least one—of a Magpie killing a rabbit. Last year on the highway near Gilstead, I noticed a dead hedgehog, and on returning later, I saw a Magpie feeding upon the carcase. Magpies are more common here than they have been for forty years. This I attribute to the fact that nearly all our gamekeepers have been drafted into other occupations.—E. P. Butterfield, Wilsden.

NEWS FROM THE MAGAZINES.

The price of *The Lancashire and Cheshire Naturalist* has been increased to 6d. a month.

'Agricultural Damage by Vermin and Birds' is the title of a paper by Mr. H. S. Gladstone in *The Scottish Naturalist* for April.

New Chalk Polyzoa, Lincolnshire Lias, Mountain Building, Datum-lines in English Keuper, and Isostasy, are among the subjects discussed in *The Geological Magazine* for March.

Two parts of the *Essex Naturalist* have recently appeared covering the period July, 1915-March, 1917; each is filled with valuable papers and reports upon the Natural History and Archæology of the county.

In *The Quarterly Journal of the Geological Society*, No. 288, Dr. Stanley Smith has a paper on '*Aulina rotiformis*, gen. et. sp. nov., *Phillipsastræa hennahi* (Lonsdale) and *Orionastræa*, gen. nov.', which is well illustrated.

British Birds for April records two Great Skuas, near Flamborough, in November last, and the appearance of a Swallow near Blackpool on March 5th of this year. There is also a coloured plate of the Marsh Warbler.

In *The Entomologist* for April, Mr. T. H. Taylor gives some 'Observations on the Habits of the Turnip Flea-Beetle,' made at Garforth and Leeds. The same journal contains a note on the 'Abundance of Black *Phigalia pilosaria* at Burnley.'

In *The Irish Naturalist* for March, Messrs. R. A. Phillips and A. W. Stelfox have an illustrated paper on 'Recent Extensions of the Range of *Pisidium hibernicum*,' in which they record its presence in Lancashire, Cheshire and the Isle of Man.

In *The Entomologist's Record* for March, Capt. Bowater describes 'Inbreeding *Amphidasis betularia*' to the seventh generation, and Mr T. A. Chapman describes a specimen of an Ant, *Myramica scabrinodis*, which lived over 50 days without a head and part of the time also without some of its legs.

A few days ago (says *The Field*) a very large eel, 43 in. long, and 5 lb. 8½ oz. in weight, was captured as it was making its way through the grass from a large pond to an old mill sluice some little distance away. The pond is situated close to the railway near Horsforth. The old mill sluice is indirectly connected with the River Aire.

The Lancashire and Cheshire Naturalist for February contains reports of the Fauna Committee for the two counties, dealing with Birds, Chelifers, Rhynchota, Odonata, Neuroptera, Orthoptera and Protozoa. In the same journal it is recorded that in two fields near Warrington recently there were at least 10,000 mole-hills of various sizes.

Wild Life for February contains the following articles, most of which are well illustrated:—'Guillemots and Razorbills,' by F. B. Kirkman; 'Wild Cats of the Double-Normal Colouration,' by F. D. Welch; 'Some Observations on Birds' Songs and Calls,' by C. W. Colthrup; and 'Some Birds of North-west Surrey,' by E. Pettitt.

A writer in *Nature* complains of the fact that the British Association meeting has been postponed, and suggests that a shorter meeting might be held in London, for which he certainly gives good reasons. It does seem strange that at present, of all times, the British Association *for the Advancement of Science* should be practically dormant for two years!

Some very important criticisms on the suggested National Union of Scientific Workers occur in *The New Phytologist* published on March 11th. They should be read by all interested in the subject. In the same journal are some remarks on 'The Reconstruction of Elementary Botanical Teaching,' one line of which, on page 6, reads: 'a perusal of ecological iterature; as Huxley said of holastic philosophy'; evidently the subject has been too much for the compositor!

NORTHERN NEWS.

'Potato Growing' is the title of Leaflet, No. 173, distributed free by the Board of Agriculture and Fisheries, 3 St. James' Square, London, S.W. 1.

In an obituary notice in *The Entomologist's Record* for March we learn that 'Mr. L.—— leaves a widow and one daughter, who is married to the Rev. ——, *with whom all his friends will feel the deepest sympathy*'!

We notice the Belfast Museum is paying particular attention to Food Economy and other matters which are being brought to the fore at the present time, and in addition is issuing useful leaflets for distribution, bearing on these subjects.

Food Production leaflet No. 34, issued free by the Board of Agriculture and Fisheries, deals with the Canning of Fruit and Vegetables. We should evidently follow our American friends' advice and eat what we can and can what we can't.

The Darlington Evening Despatch for March 9th, contains an account of some neolithic flint weapons found while digging allotments at Darlington. We have since had these specimens submitted to us; they are not neolithic and not implements.

The presidential address of Mr. William Pickup, entitled 'Mining Education and Research in Lancashire: An Appeal for Wider Interest and Greater Support,' appears in *The Transactions of the Manchester Geological and Mining Society*, Vol. XXXV., Part 6.

At the Anniversary Meeting of the Geological Society of London, the Lyell Medal, together with a sum of £25 was awarded to Mr. Henry Woods, as an acknowledgement of the value of his researches in Palæontology, more particularly on the Fauna of the Cretaceous Period.

The Council of the Geological Society of London has made the sixteenth annual award of the Daniel Pidgeon Fund to James Arthur Butterfield, M.Sc., F.G.S., Demonstrator in Geology in the University of Leeds, who proposes to conduct researches in connection with the Conglomerates and Sandstones underlying the Carboniferous Limestone Series of the N.W. of England.

Messrs. Longman, Green & Co. have published a second edition of Thorburn's beautiful volumes on 'British Birds,' the first edition of which was noticed in these columns at the time. The remarkable series of 'additions to the British Fauna,' principally made in Sussex, as well as one or two records of a more reliable nature, have necessited two additional plates, 80a and 80b, in order to bring the work up to date. These plates, together with the accompanying letterpress, are also printed separately as a supplementary part and can be obtained at 6/- net by those requiring them in order to keep their volumes up to date.

At the Annual Meeting of the British Ornithologists' Union, Dr. W. Eagle Clarke, keeper of the Natural History Department of the Royal Scottish Museum, was unanimously elected president for the ensuing term of five years. One Northern naturalist has thus succeeded another, Colonel Wardlaw Ramsay, in election to this honour, the blue ribbon of British ornithology. Dr. Eagle Clarke's studies of bird-life, and in particular of bird migration are well known, and his services to the cause of ornithology are evidenced by the position he held on the British Association Committee on Bird migration, for which he prepared the final reports, as well as by his selection to serve on the Government Departmental Committee, of the Home Office, which has at present under revision the Wild Birds' Protection Acts. As an editor of *The Scottish Naturalist* he is well known, and under his care the exhibited collection of British birds in the Royal Scottish Museum has gained the reputation of being the finest in existence. He has served in the capacity of Hon. Secretary and President of the Yorkshire Naturalists' Union.

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JUNE 1918. No. 737
(No. 511 of current series.)

THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY
T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
THE MUSEUMS, HULL;
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Smithsonian Institution
JUN 24 1920
Natural History Museum

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NOTES AND COMMENTS.

MUSEUMS AND LEARNING.

In *The Museums Journal* for May, Dr. F. A. Bather has a timely essay on 'Museums and the Advancement of Learning.' In the February number of that journal he had already recounted numerous forms of help given to the nation at war by its national museum. His object in the present article is to show that all such forms of economic aid are rendered possible only by the accumulation and arrangement of reference collections. Indeed he claims that the systematic study and classification, which is peculiarly the task of the museum man, is the ultimate basis of all the natural sciences and of many other branches of learning. From the admirable paper we extract the following :—'The first business of the museum is to afford a safe and permanent home for collections of material objects. These may be acquired through others, or the museum may with advantage send out its own collectors. That is a question of administration : the essential duty of the museum official is the preservation of the specimens entrusted to him.'

LABELLING.

The next business is to see that every specimen is furnished with an indication of its original locality, mode of occurrence, and any historical facts concerning it. Many ways of doing this are familiar to curators. Then the specimens must be arranged in such a manner as to be readily accessible for reference by accredited students. To accomplish this is required, first, a logical scheme of classification. This scheme must be practicable for the curator, who is inevitably governed by the mode of preservation of his specimens (*e.g.*, in spirit, or skins, or fossils). On the other hand it must be in relation with the scheme adopted by the majority of students—what they would admit as a 'scientific' classification.

CLASSIFICATION.

The curator therefore must be familiar with scientific studies, and he must have such knowledge as will enable him to perform the necessary preliminaries of identifying and sorting. Since no museum in the world has a staff large enough to permit of its officials having the detailed knowledge required, every museum in greater or less degree is obliged to call in the aid of specialists. The modes of obtaining this outside help are various, but there is no need here to reveal the secrets of diplomacy. However they be persuaded, such namers and sorters are for the nonce museum workers. The official curator has to gather up and apply the results of their labours.

CATALOGUES.

Next, for the museum to be of its full value to the scientific public, especially to workers in other countries, it is necessary

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to publish catalogues. These need not always rival the monographic volumes issued by the British Museum, but they must follow the scientific classification and must be something more than mere lists. Their compilation requires critical judgment and thorough knowledge, so that here also the services of outside helpers are needed. . . . .

PUBLICITY.

We must no longer pretend that the more or less intellectual gratification of the man in the street is our chief aim. Let us dare to be frank with the people, neither deceiving them as to our objects, nor leaving them ignorant. The popular articles being issued by the United States National Museum, and largely intended for use by the press, are an example of judicious and dignified advertisement most worthy of our imitation. It sounds a truism to say that the greatest enemy of knowledge is ignorance, but for all that the remark will bear some pondering over. If we cannot justify and explain our particular bits of work to the men of ordinary education, we may find possibly that we cannot justify them to ourselves. That, at any rate, would be a gain. I believe that the most esoteric branches of museum work can be justified, to ourselves, to our scientific colleagues, and to the public ; and that it is our bounden duty to do so without delay.

A VORACIOUS MARINE PEST.

At the annual meeting of the Eastern Sea Fisheries Board, held at Spalding recently, the Inspector (Mr. H. Donnison) stated that star-fish, mostly small in size, and some not as big as a three-penny piece, had been very abundant, and constant attention on the part of the staff had been necessary to prevent them doing serious damage to the shell-fish beds. In the channels and on some low-lying ground which seldom bares, star-fish congregated and devoured every mussel and cockle around them, gradually working up the sides of the sands for more. A small special trawl, designed by the crew of the Protector, was very useful in obtaining about 37 tons (which meant some millions) of the pest.

THE MORTIMER COLLECTION.

We learn from *Nature* that ' Hull is probably one of the few places in this country which are extending their Museums in these times. It will be remembered that during the Museums Conference at Hull, in 1913, Col. G. H. Clarke purchased for £1,000 the Mortimer collection of Yorkshire archæological and geological specimens, which the members had an opportunity of visiting at Driffield, and as the building is now required for other purposes, the collections have been removed. The Hull Corporation has taken some temporary premises in Albion Street, in the centre of the city, and in these the entire

collection has recently been placed, and steps have been taken to prepare the Museum for public inspection. When it is remembered that in the archæological collection alone there are the entire contents of nearly four hundred barrows of the bronze age, as well as several hundred skulls of Prehistoric, Roman and Saxon date, and there are about 1,000 Prehistoric, Roman, Saxon and Mediæval vases, some of large size, and the contents of several Anglo-Saxon and Roman cemeteries, it will be understood that the removal of the collection has been an undertaking of some magnitude. Nearly 20 van-loads were required to remove the specimens, and we understand the entire collection, consisting of about 60,000 objects, has reached its new quarters without damage.'

AMMONITE NOMENCLATURE.

At a recent meeting of the Geological Society of London, Mr. A. E. Trueman read a paper on 'The Evolution of the Liparoceratidæ.' The Ammonites considered included several sub-parallel series, of which four genera were indicated by Mr. S. S. Buckman in 'Yorkshire Type Ammonites.' The details of ontogeny and the sutures, which had not hitherto been compared, have been employed in constructing tables showing both the biological and the stratigraphical relations of the various species; a revision of the existing classification is proposed. The early members of each series are similar 'capricorn' forms with slender whorls and stout ribs (for instance, *A. capricornus*, *A. latecosta*, *A. maculatus*). In somewhat later examples the outer whorl is swollen, and has paired tubercles (for instance, *A. heterogenes*). From this stage the tendency is to shorten the period with slender capricorn whorls by accelerating the development of bituberculation and prolonging the period of pre-costate globose whorls; thus the most advanced members of each series are stout bituberculate forms (for instance, *A. striatus*, *A. bechei*), which do not pass in development through a capricorn stage.

NEW GENERA.

The following genera may be recognized; each includes ammonites of the three types mentioned above:—

1. An earlier group, with tubercles paired in the involute stages; Radstock (Somerset) is the only British locality where these ammonites have been found.

Parinodiceras, gen. nov. Elevated whorl, paired tubercles, the inner and outer rows widely separated. Genoholotype. *Ammonites striatus parinodus* Quenstedt (1884, pl. xxviii., fig. 6).

Gen. nov. Round whorl, with the rows of tubercles placed close together. Genoholotype, a specimen to be figured as a new species.

2. A later group, with unpaired tubercles in the involute stage. These genera are most readily distinguished by sutural characters, namely, the relative depths of the external lobe

(EL) and the first lateral lobe (IL), and by the width of the external saddle (ES).

(*a*) With narrow ES (not reaching to the outer tubercles).

Liparoceras Hyatt. IL and EL about equal in depth. Genolectotype *Ammonites striatus* Bronn.

Becheiceras, gen. nov. IL deeper than EL. Genoholotype, *Ammonites bechei* Wright ('Lias Ammonites' pl. xli., fig. 1).

Anisoloboceras, gen. nov. IL much deeper than EL. the ventral lobules of IL almost meeting under EL. Genoholotype *Ammonites nautiliformis* J. Buckman.

(*b*) With wide ES, reaching to the outer tubercles.

Ægoceras Waagen. EL and IL about equal in depth, IL symmetrical Genolectotype, *Ammonites planicostus* d'Orbigny.

Androgynoceras, Hyatt. IL and EL about equal in depth, IL asymmetrical. Genolectotype, *Ammonites hybrida* d'Orbigny.

Oistoceras S. S. Buckman. Ribs with sharp peripheral curve. Suture similar to *Androgynoceras*. Genoholotype, *Ammonites figulinus* Simpson.

Amblycoceras Hyatt. Ribs with slight peripheral curve. IL shallower than EL. Genoholotype, A. *capricornus* Hyatt, 1900.

These ammonites generally occur in the upper part of the Lower Lias, where it has been usual to recognize a *capricornus* zone overlying a *striatus* zone. Careful collecting has shown, however, that there are several horizons with capricorn ammonites of different series and several with the involute forms evolved from them.

MR. S. S. BUCKMAN'S OPINION.

A letter was read from Mr. S. S. Buckman, in which he states: 'The family Liparoceratidæ is very interesting. In its geological distribution it illustrates the principle of faunal repetition alluded to in my last paper communicated to the Society. In its mophology, showing successive waves of capricorns developing into bituberculate sphærocones, which may perhaps unduly hearten the protagonists of orthogenesis, it shows the difficulties that confront the field-geologist until a study like the author's places facts in a clear light. In its biological development it illustrates the various phases of palingenesis which in "Yorkshire Type Ammonites" I have called saltative, cunctative, precedentive. In the last, the hastening in development of one feature faster than another, we seem to have the clue to the origin of species—it makes for diversity of general while tachgenesis, or the earlier acquirement of characters, gives the differences of species. What was the cause of precedentive palingenesis touches the debatable ground between Weismannism and Neo-Lamarckism. I confess to a predilection for the latter—that the variations of the germ-plasm were not fortuitous, but, in some way, reflect modifications of the somatic cells induced by their responses to differences of environment. Data for solving this problem are required, and evolutionary studies such as those given by the author may be of great assistance.'

THE FIELD GEOLOGIST.

Notwithstanding the undoubted merit of the paper, we must say we sympathise with the president, Mr. G. W. Lamplugh, F.R.S., who commented on the high importance, both to biologists and to stratigraphers, of intensive palæontological studies of this kind. He wished, at the same time, to call attention to the difficulties felt by the field geologist, when robbed of his crude nomenclature of the commoner fossils by the precise definition and complicated analysis now attempted by the palæontologists. For general service some kind of name was essential, but was becoming increasingly difficult to acquire or retain. For example, it was most desirable to be able to express, as proof that certain beds were Upper Lias, that they yielded *Ammonites communis, bifrons* and *serpentinus*, for every geologist would understand the statement. It might be based, quite soundly, on material so poor that no palæontologist could name the specimens, or so good that only a very small number of specialists in these particular forms would dare to do so. The growing difficulty would have to be met by some means, even if it entailed a duplication of nomenclature. We might have to continue to use indispensable names in a general sense, perhaps with some indication by type or symbol to warn the specialist.*

THE GLACIAL PERIOD.

A quarter of a century ago Prof. Kendall had much to do with the formation of the new school of Glacialists, which endeavoured to interpret the drift phenomena of this country on the basis of one Ice Sheet with an oscillating ice-front. This theory simplified the complicated evidences supplied by the newer deposits in this country, though for a time the upholders of the 'submergence' theory, and those who held the belief that there were numbers of different glacial periods, held sway. But since that time, the submergers having become submerged, and the 'many glacial periods'-men having left us or having been converted, the new school practically holds the field. Prof. Kendall, like Jupiter, had a number of attendant satellites, some of whom in recent years had feared that the planet showed traces of wobbling in its orbit, though as true satellites they were perforce destined to dance round the chief whatever course he took, yet perhaps wondering whither the path might lead. This question is now settled, however, oddly enough by a German publication (already

* The Author, in reply to the President, pointed out that, while it was undesirable to use the names *Ammonites striatus* and *A. capricornus* with the wide meaning formerly given to them by stratigraphical workers, yet such terms as 'capricorn ammonite' and '*striatus*-like ammonite' could be so used.

noticed in these pages, see *ante* p. 55) in which Prof. Kendall clearly gives, for the first time, his views of the question based on recent researches.

THE GLACIAL QUESTION.

In the *Handbuch der regionalen Geologie* Prof. Kendall was entrusted with the section devoted to 'Carboniferous, Permian and Quaternary of Great Britain,' a reprint of which has recently come into our hands. It is the last section of this which is of such value on the Glacial question; the author reviews the evidence of the Glacial Period in Britain, and a perusal of the pages brings back to mind the heated controversies of years ago, in which Reade, Reid, Bell, Jamieson, Howorth, James Geikie, Lamplugh, Bonney, H. C. Lewis, Tiddeman and many others took part.

DEEP GORGES.

After dealing with the question of the raised beaches, Prof. Kendall states 'In apparent conflict with the evidence of pre-glacial raised beaches is that of a deep-sunken series of river-valleys found in many parts of the glacial regions, of which a few examples must suffice.' After referring to these he continues 'three explanations of this common phenomenon may be offered—(1) That there was another outlet for the pre-glacial drainage—this is highly improbable in the case of the Mersey and impossible in those of the Tyne and the Humber: (2) That there has been a depression of the interior of the country in consequence of the imposition of the ice-load, from which the recovery is not yet complete—this is highly improbable, for in the cases of the Tyne, Humber and Mersey, the greater load was at the seaward end and therefore the depression should have been greater there: (3) The last is that the interior regions have suffered great glacial erosion. This view, to which the writer has been brought with some reluctance, has much to commend it. The existence of thick deposits of boulder clay, consisting very largely of the ground-up materials of the subjacent rock-floor, is proof of very drastic local erosion. The floor of the Vale of York is a good illustration of this fact. It consists of the soft sandstones and marls of the Trias, and, not only do these materials occur in recognisable fragments in the drift, but the boulder-clays owe their strong red colouration to triturated marl and to the presence of large quantities of Triassic sand grains still retaining the characteristic pellicle of iron oxide.'

INTERGLACIAL CONDITIONS.

With regard to the interglacial conditions we learn 'The British evidence of Interglacial Conditions' is indecisive. While Prof. James Geikie (1894) argues for an extensive series of Glacial and Interglacial periods, Clement Reid recog-

nises no more than one interruption of the continuity of the Ice Age. Lamplugh (1914) speaking from an intimate knowledge of many large areas of glacial deposits in Ireland, the Isle of Man, Derbyshire, and the East Coast of England, declares himself unable to recognise any break in the succession of more then local value. The present writer has for 25 years held the same opinion, but long reflection upon a series of facts, quite other than those heretofore considered, have convinced him of the existence of a very early glaciation in Yorkshire that is separated by an immense interval of time from the stage represented by the York moraines. At the same time he is not prepared to say, or to suggest, that during that interval there was a disappearance of the ice from the regions to the north or that there was anything more than a wide oscillation of the ice margin. The evidence adduced in the preceding section seems indeed to show that, once the Scandinavian ice began to exercise an influence upon the British shores, it never wholly withdrew until the final liberation of the coast of Aberdeenshire.'

ONE ICE AGE.

Prof. Kendall concludes, 'The physical evidence of great fluctuations of the ice-margins in England is clear and convincing, but the present writer is not prepared to assent to the proposition that these fluctuations were more than local, or that between the successive retreats and readvances of the ice, there was a complete withdrawal of the ice-sheets back to the very sources. At one time it was considered sufficient to point to a bed of sand or gravel interpolated between two sheets of boulder-clay to demonstrate an interglacial period; now, however, only very large sheets are accepted as proof, yet they do but prove oscillations relatively larger, and not complete withdrawal. Much more of the nature of the proof demanded is, however, available in Yorkshire. While the drift phenomena are preserved in wonderful freshness and completeness in the Cleveland area and the Vale of York—little lake-channels, small but sharp moraines, kettle-holes and like evidences of recent glaciation retaining their features almost unimpaired—outside (*i.e.* south of) the great moraine at Escrick the Drift deposits are reduced to a series of small and disconnected patches.'

BALBY BOULDER CLAY.

'One of the most remarkable for its situation is that at Crosspool, Sheffield, 223 m. (730 ft.) above sea level, but as evidence of severe and prolonged glaciation, perhaps the patch of boulder-clay at Balby, near Doncaster (53° 42′ N.), is the most remarkable. It is about 800 m. (½-mile) in length and 12 m. (40 ft.) thick, and presents the finest inland section of

boulder-clay in the county, hard and very tough and closely packed with well-scratched stones, mostly local, but with a fair number of rocks from the Lake District, such as Shap granite and the micro-granite of Threlkeld. It is evident that these are relics of a great and extensive glaciation separated from the stage represented by the York and Escrick moraines by an interval many times greater than that separating the later glacial phase from the present day, even though a generous allowance must be made for the greater activity of sub-ærial denudation during the Ice Age.'

——: o :——

Nidification of the Spotted Flycatcher.—Many bird-men will be overhauling their nesting boxes at this time of year ; great-tits, blue-tits, coal-tits, marsh-tits, redstarts, will, no doubt, be catered for ; but not many naturalists think of assisting that true little friend of the gardener—the Spotted Flycatcher ; it is true this bird can generally find a niche in a creeper or wall in which to fix a nest, but it does appreciate a little human assistance as the following instance shows. In the late spring of 1916 a pair of Spotted Flycatchers took up its abode in the garden of my house at Ripon, which stood at the end of a row of houses ; they searched eagerly for a suitable nesting site, and could find nothing better than the top of a spout under the eaves ; I watched them trying to fix a grass foundation in the perforated zinc which covered the spout, and realized that it would be a poor situation in wet weather ; so I made a small box with a roof over it, and fixed it on the wall of the house about six feet below the spout ; I then swept off the beginnings of the nest from the spout. The very next day, the flycatchers commenced a nest in the box, and within a week the first egg was laid ; on June 2nd the hen began incubating five eggs ; unfortunately (I believe through the interference of sparrows) one egg was broken on June 3rd, and the nest and eggs were deserted. After two days, as the birds did not return to the nest, I cleared out the box ; then the flycatchers, unable perhaps to find another suitable site, visited the box, and finding it ' swept and garnished ' straight-way began to build in it again, and on June 20th the hen was sitting on four eggs ; this time all went well and four young birds were brought off. The following year, when I moved into Bolton Abbey Rectory, I brought the box with me and set it up six feet from the ground on the outside of the beautiful old porch ; a pair of spotted flycatchers at once took possession and hatched off their brood in it successfully, and this in spite of the fact that there are several creepers growing up the front of the house with many possible nesting sites.—Cecil F. Tomlinson, Rector of Bolton Abbey.

Naturalist,

APTERYGOTA FROM YORKSHIRE AND DERBYSHIRE.

JAMES MEIKLE BROWN, B.Sc., F.L.S., F.C.S.
Sheffield.

SINCE the pioneer work carried out by Lubbock (1862-70), culminating in the publication of his 'Monograph' by the Ray Society in 1873, the groups of insects included under the term 'Apterygota' have been rather neglected in this country. A considerable amount of systematic work has been done by continental naturalists such as Tullberg, Reuter, Schött, Schäffer, Börner, Linnaniemi and others, but until Prof. Carpenter of Dublin took up the group, few important papers dealing with the distribution of Collembola and Thysanura in the British Isles appear to have been published. A number of writers of late years, however, have partially made up for this deficiency. Carpenter has published records for Ireland, Carpenter and Evans for parts of Scotland, Collinge and Shoebotham for the Midlands., Bagnall for the North of England and Carr for Nottinghamshire. In these papers, except for two casual notices (referred to below), I find no records of Yorkshire or Derbyshire species, and hence the list given in this paper, including though it does, many common species, may be of interest.

Most of the species enumerated here were collected last year during (1) a short visit to Wharfedale and Wensleydale in late July, (2) a longer stay in the Bakewell district during August, and (3) at various times in the more immediate neighbourhood of Sheffield.

The nomenclature used is in most cases that of Linnaniemi (Axelson) in 'Die Apterygotenfauna Finlands,' 1912.

Order: COLLEMBOLA.
Family: PODURIDÆ.

Podura aquatica L. Common on stagnant cattle ponds, etc. Hackfall Wood, Beauchief, Over Haddon.*

Achorutes armatus (Nic.). Common under bark and fallen branches. Ecclesall Woods, Haddon Meadows,* Dore*, Holmesfield,* Cordwell,*

var. *inermis* Axels. Ecclesall Woods.

A. longispinus Tullb. Under bark. Ryecroft Glen.*

A. purpurescens Lubb. Bakewell.*

Xenylla grisea Axels. Under bark of fallen trees. Ecclesall Woods.

X. humicola (O. Fabr.) Tullb. Reported by Bagnall from Saltburn.†

X. maritima Tullb. Ryecroft Glen*, Grindleford,* Bakewell.*

Pseudachorutes subcrassus Tullb. Cordwell.*

Onychiurus armatus (Tullb). Very plentiful under fallen branches, etc. Beauchief, Ecclesall Woods, Bolton Woods, Hassop,* Haddon,* Monsal Dale,* Dore,* Cordwell.*

O. fimetarius (L. Lubb.). Under stones. Bolton Woods.

* Localities starred * are in Derbyshire, the remainder are in Yorkshire.
† In *Trans. Nat. Hist. Soc. of Northumberland*, etc., 1910.

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Onychiurus ambulans (L. Nic.). Under stones. Ecclesall, Dronfield.*
Neanura muscorum (Templ.). Very common under bark, etc. Beauchief, Ecclesall Woods, Dore,* Cordwell,* Bakewell.*

Family : ENTOMOBRYIDAE.

[*Archisotoma* (*Proisotoma*) *besselsi* (Pack) Axels. Reported by Bagnall from Saltburn].†
Folsomia fimetaria (L.) Tullb. Under flower-pots in a garden. Millhouses.
F. quadrioculata (Tullb). Under bark. Ryecroft Glen.*
Isotoma viridis Bourl, Schött. Plentiful everywhere under stones, bark, etc. Ecclesall Woods, Beauchief, Kettlewell, Dore,* Cordwell,* Barlow,* Bakewell,* etc.
var. *riparia* (Nic.). In a garden. Millhouses.
I, cinerea (Nic.). Tullb. Under bark. Ecclesall Woods, Grassington, Bakewell,* Froggat,* Grindleford,* Ryecroft Glen.*
I. sensibilis Tullb. Bakewell.*
I. arborea (L.) Ågr. Ecclesall, Totley,* Bakewell,* Grindleford.*
I. grisescens Schaff. Fulwood, Totley,* Cordwell.*
Tomocerus minor (Lubb.). Very common under stones, bark, etc. Ecclesall Woods, Redmires, Hackfall Woods, Grassington, Totley,* Dore,* Cordwell,* Barlow,* Bakewell,* etc.
T. vulgaris (Tullb.). Less common than the preceding species. Grassington, Totley.*
Isotomurus palustris (Müller). Common in damp places under fallen branches and on the surface of weedy ponds. Redmires, Hack Fall Woods, Millhouses, Dore,* Barlow,* Cordwell,* Ashford,* etc.
var. *prasina* Reut. Ashford.*
Entomobrya nivalis (L.). Ecclesall Woods, Bakewell,* Ashford.*
E. albocincta (Templ.). Frequent under bark, etc. Grassington, Stakepass, Haddon,* Alport,* Bakewell,* Lathkil,* Hassop.*
E. nicoleti (Lubb.). Common. Beauchief, Ecclesall Woods, Grassington, Bakewell,* Monsal-dale,* Lathkil,* Hassop,* Calver,* Dore,* Cordwell.*
E. muscorum (Tullb.). Cordwell,* Bakewell,* Over Haddon.*
E. multifasciata (Tullb.). Haddon,* Bakewell,* Barlow,* Dore,* Cordwell*
E. lanuginosa (Nic.). Bakewell.*
Seira nigromaculata Lubb. Common on window-sills, doorsteps, woodwork in conservatories, etc. Ecclesall, Millhouses, Bakewell.*
Sinella curviseta Brook. Ashford.*
Lepidocyrtus lanuginosus (Gmel.) Tullb. Very common under bark, stones, etc. Ecclesall Woods, Millhouses, Beauchief, Bakewell,* Barlow,* Dore,* Cordwell.*
L. cyaneus Tullb. Less common. Ecclesall Woods, Beauchief, Stakepass, Bakewell,* Haddon.*
L. curvicollis Bourl. Ecclesall Woods, Bakewell.*
Orchesella cincta (L.) Lubb. Very common (it was especially plentiful on limestone walls after rain at Alport). Grassington, Stakepass, Hack Fall Woods, Redmires, Ecclesall, Bakewell,* Lathkil,* Alport,* Monsal Dale,* Barlow.*
var. *vaga* (L.). Grassington, Ecclesall Woods, Alport,* Calver.*
O. rufescens Tullb. (=*flavescens* (Bourl)). Millhouses, in a garden; Bakewell.*
Heteromurus nitidus Templ. Occasionally under stones. Grassington, Bakewell,* Over Haddon.*
Cyphoderus albinus Nic.). Occasionally in ants' nests. Lathkil Dale,* Ashford.*

Family : SMINTHURIDÆ.

Sminthurides aquaticus (Bourl). On the surface of ponds. Heeley; Wensley, Hack Fall Wood.

Sminthurides malmgreni (Tullb.). var. *elegantula* (Reut). On the surface of ponds. Hack Fall Wood, Haddon-meadows,* Lathkil Dale.*

Bourletiella lutea (Lubb.). Common on grass and flowering plants. Aysgarth, Grassington, Dore,* Cordwell,* Lathkil Dale.

B. sulphurea (Koch) Born. On plants. Aysgarth, Grassington, Millhouses (garden), Dore,* Cordwell,* Calver,* Lathkil,* Bakewell.*

var. *pallipes* (Bourl.). Frequently with the type form. Millhouses (garden), Cordwell* (on oats, etc.), Lathkil,* Monsal Dale.*

B. hortensis (Fitch.). On plants. Millhouses (garden).

B. insignis (Reut.). On plants. Lathkil,* Haddon.*

Sminthurus viridis (L.) Lubb. Common on grass. Grassington, Cordwell,* Grindleford,* Lathkil,* Monsal Dale,* Haddon Meadows.*

Dicyrtoma fusca (Luc. Lubb.). Under fallen trunks. Very plentiful in Winter. Ecclesall Woods. Totley,* Cordwell,* Haddon Meadows*

Dicyrtomina minuta (O. Fabr.). Under fallen branches. Totley,* Cordwell,* Bakewell,* Ashford,* Haddon,* Lathkil Dale.*

var. *ornata* (Lubb.). Rather more plentiful than the type, especially so in winter. Ecclesall Woods, Haddon,* Cordwell,* Totley.*

Order 2 : THYSANURA.

Family : CAMPODEADAE.

Campodea staphylinus Westw. Frequent and widespread, under stones. It appears to be scarce in limestone districts. Ecclesall Woods, Redmires, Fulwood, etc., Hassop,* Bakewell.*

Family : MACHILIDAE.

Machilis polypoda (L.). Fairly common under pieces of limestone and about limestone walls. Hassop,* Bakewell.*

Petrobius maritimus Leach. Common on the rocks at Robin Hood's Bay. Specimens of this species were kindly supplied by Prof. Denny.

Family : LEPISMIDAE.

Lepisma saccharina L. Occurs in houses, Sheffield. It appears to be lesson common than formerly.

SELECTION OF LITERATURE DEALING WITH BRITISH APTERYGOTA.

BAGNALL, R. S.—' Short notes on some new and rare British Collembola ' in *Trans. Nat. Hist. Soc.* of Northumberland and Durham, III., 1910.

BROOK, G.—' Notes on some little-known Collembola, etc.' in *Journ. Linn. Soc.*, XVII., 1884.

CARR, J. W., in ' Invertebrate Fauna of Nottinghamshire,' 1916.

CARPENTER, G. H.—Various papers in *Irish Naturalist* for 1897, 1907, 1908, 1911, 1913, etc.

CARPENTER, G. H.—Clare Island Survey, ' Apterygota ' in *Proc. Roy. Irish Acad.*, XXXI., 1913.

CARPENTER, G. H. and EVANS, W.—' Collembola and Thysanura of the Edinburgh District ' in *Proc. Roy. Phys. Soc. Edin.*, XIV., 1899.

CARPENTER, G. H. and EVANS, W.—Some Springtails new to the British Fauna ' in *Proc. Roy. Phys. Soc. Edin.*, XV., 1904.

COLLINGE, W. E., and SHOEBOTHAM, J. W.—' The Apterygota of Hertfordshire,' in *Journ. Econ. Biol.* V., 1910.

EVANS, W.—' Records of Collembola and Thysanura from the Clyde Area ' in *Ann. Scot. Nat. Hist.*, 1901.

LUBBOCK, J.—' Notes on Thysanura ' in *Trans. Linn. Soc.*, Vol. XXIII. (1862), XXVI. (1868), XXVIII. (1870) ; ' Monograph of the Collembola and Thysanura,' *Ray Soc.*, 1873.

TEMPLETON, R.—' Irish Thysanura ' in *Trans. Ent. Soc.*, Vol. I., 1834.

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ASTATUS STIGMA PANZ. IN YORKSHIRE.

W. J. FORDHAM, M.R.C.S., L.R.C.P., F.E.S.

Among some *Hymenoptera* (mainly *Ichneumonidæ*) recently determined for me by Mr. Claude Morley, F.Z.S., is a specimen of *Astatus stigma* Panz ♀, which was captured in flight on August 12th, 1917, in a sandy field on Brayton Barff. near Selby (V.C. 64). Saunders (*Hymen. Acul.* pp. 78-79) says 'on sandy commons, etc., July, August; very rare,' and gives nine localities, all in the South of England except Wallasey and Southport. He notes that the species is so rare that nothing is known of its habits. Smith and Shuckard both record the prey of the allied *A. boops* Schr. (which is not rare, but local) for the sustenance of its larvae to be the larva of a species of *Pentatoma*, but Smith has also observed it carrying home specimens of *Oxybelus*. Since Saunders' work was published in 1896, the species has been found in a few other places and Mr. Rosse Butterfield possesses specimens from the New Forest, but the range has not been extended, as the most northerly new stations recorded are North Wales* on the West and Skegness† on the East.

Nothing definite has been ascertained as to its life history by these recent observations, but on two occasions (Wallasey, 1891‡ and Criccieth, 1900),‖ Mr. Willoughby Gardner has found it in proximity to *Pompilus plumbeus* colonies and suggests that there may be some connection between the two species and it may be noted that the specimen taken by Professor Carr at Skegness† was in a patch of sandy ground where *P. plumbeus* swarmed, together with a few *P. gibbus*.

On the other hand Saunders records it in numbers at Littlehampton§ (the ♂ most numerous), but he could not observe it to prey on anything, though the larvæ of several species of *Lygæidæ* were present. A fly *Scopolia carbonaria* Pz. also occurred with it and resembled the Fossor greatly at first sight. At present therefore the prey is in doubt, but bearing in mind that *A. boops* captures both bug larvæ (*Pentatomidæ*) and a fossor (*Oxybelus*) it is quite possible that our species may do the same with *Lygæidæ* and *Pompilus*. Several of the new records extend the time of appearance of the species to include June. It is to be hoped that Yorkshire hymenopterists will keep a sharp look-out for this interesting species during the coming season, from June to August. *Pompilus plumbeus* is recorded for the county and several species of *Lygæidæ* are commonly obtained.

* Nevinson, *Ent. Mon. Mag.*, 1900, 62.
† J. W. Carr, *Ent. Mon. Mag.*, 1900, 15.
‡ Willoughby Gardener, *Ent. Mon. Mag.*, 1892, 23.
‖ Willoughby Gardner, *Ent. Mon. Mag.*, 1900, 242.
§ E. Saunders, *Ent. Mon. Mag.*, 1898, 213.

WESTMORLAND COLEOPTERA.

F. H. DAY, F.E.S.

HITHERTO, I believe, no list of the beetles of Westmorland has been published, although at various times a few notes of captures by visiting coleopterists have appeared in the entomological magazines.

In and about the year 1905, Mr. T. Bowman, of Tebay, collected extensively in that district, submitting his captures to Mr. H. Britten, then resident at Great Salkeld, for names. On his removal to Oxford, Mr. Britten placed in my hands the records so obtained, supplementing them later with numerous notes from his own observations in various Westmorland localities. I have also done a little collecting in the county, and think that the accumulated notes now in my possession are of sufficient interest for publication as the basis of a more complete county list.

I have added a few records on the authority of Rev. T. Blackburn (*E.M.M.*, 1864-5, pp. 145-147, and 1865-6, pp. 87-88); of Rev. T. Wood (*E.M.M.*, 1899, p. 213); of J. E. Black (*Ent. Record*, 1904, p. 246); and of M. L. Thompson (*The Naturalist*, 1913, p. 235) and Mr. Thompson has favoured me with a few additional notes *in litt.* I have also used the Westmorland records in Fowler's *Coleoptera of the British Isles*, which, however, are not numerous, but probably include all the information available at the time. With regard to Mr. Black's paper mentioned above, it should be pointed out that the localities referred to are in Westmorland and not Cumberland as stated.

I shall be glad to hear from any coleopterists who have done any collecting in the county, with a view to incorporating their captures in the list as its publication proceeds. The nomenclature and arrangement is that of Newbery and Sharp's recently published 'Exchange List,' which is based on the European Catalogue of 1906.

GEODEPHAGA.

Cicindela campestris L. Shap (Day).

Cychrus rostratus L. Tebay (Bowman), Witherslack (Day), Melkinthorpe (Britten).

Carabus violaceus L. var. *exasperatus* Duft. Tebay (Bowman), Kirkby Stephen (Thompson).

C. catenulatus Scop. High Street (S. Gordon), Ulleswater district (Rev. T. Wood).

C. nitens L. Tebay, common on the moors (Bowman), Brackenber Moor (Day), Kirkby Stephen (Thompson).

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Carabus glabratus Pk.* Hills above Langdale (Fowler: Col. Brit. Isles, Vol. I., p. 8).
C. arvensis Hbst. Helvellyn (Rev. T. Wood), Rydal (Black).
Leistus fulvibarbis Dj. Tebay (Bowman), Melkinthorpe (Britten).
Nebria brevicollis F. Tebay (Bowman), Melkinthorpe, Cliburn (Britten).
N. gyllenhali Sch. Kirkby Stephen (Thompson), Shap (Britten).
Notiophilus palustris Dutt. Tebay (Bowman), Melkinthorpe (Britten).
N. substriatus Wat. Tebay (Bowman), Witherslack (Day), Melkinthorpe (Britten).
N. biguttatus F. Tebay (Bowman), Shap (Day), Melkinthorpe (Britten).
Elaphrus cupreus Duft. Tebay (Bowman), Cliburn Moss (Britten).
E. riparius L. Tebay (Bowman), Melkinthorpe (Britten).
Loricera pilicornis F. Tebay (Bowman), Melkinthorpe (Britten).
Clivina fossor L. Tebay (Bowman), Shap (Day), Melkinthorpe (Britten).
Dyschirius politus Dj. Witherslack (Day).
D. globosus Hbst. Tebay (Bowman), Shap (Day), Kirkby Stephen (Thompson).
Bembidion lampros Hbst. Tebay (Bowman), Melkinthorpe, Cliburn (Britten).
B. bipunctatum L. Kirkby Stephen (Day).
B. atrocæruleum Steph. Tebay (Bowman), Kirkby Stephen (Thompson), Lowther Park (Day).
B. tibiale Duft. Tebay (Bowman).
B. ustulatum L. (*littorale* Brit. Cat.). Tebay (Bowman), Kirkby Stephen (Day), Melkinthorpe, Askham (Britten).
B. bruxellense Wesm. Tebay (Bowman).
B. decorum Pz. Tebay (Bowman), Lowther Park (Day).
B. guttula F. Tebay (Bowman), Melkinthorpe (Britten).
B. mannerheimi Sahl. Tebay (Bowman).
Ocys harpaloides Serv. (*rufescens* Guer.) Rydal (Black).
Trechus 4-striatus Schrnk. (*minutus* F.) Tebay (Bowman), Kirkby Stephen (Thompson), Melkinthorpe, Cliburn (Britten).
T. obtusus Er. Tebay (Bowman), Melkinthorpe (Britten).

* We have in the Hull Museum collection specimens of *Carabus glabratus* taken on Helvellyn, and *C. arvensis* taken on Ill Bell by me. I also found *Nebria gyllenhali* common near Ambleside and in wet places on Helvellyn; also *Dianoïs cærulescens* under stones by stream sides near Ambleside.—T. Stainforth.

Patrobus assimilis Chaud. Ulleswater District (Rev. T. Wood), Rydal (Black), Askham Fell (Britten).
P. excavatus Pk. Tebay (Bowman), Melkinthorpe (Britten).
Badister bipustulatus F. Tebay (Bowman), Melkinthorpe (Britten).
Ophonus pubescens Müll. (*ruficornis* F.). Witherslack (Day).
Harpalus latus L. Tebay (Bowman), Melkinthorpe (Britten).
Tetraplatypus similis Dj. Tebay (Bowman), Melkinthorpe (Britten).
Bradycellus collaris Pk. Tebay (Bowman) Langdale Pikes (Fowler, Col. Brit. Isles, vol. I., p. 42).
Amara ovata F. Tebay (Bowman).
A. trivialis Gyll. Melkinthorpe (Britten).
A. communis Pz. Tebay (Bowman), Witherslack (Day).
A. lunicollis Schiöd. Tebay (Bowman), Melkinthorpe (Britten).
A. apricaria Pk. Tebay (Bowman).
A. aulica Pz. Tebay (Bowman), Pendragon Castle (Day).
Stomis pumicatus Pz. Tebay (Bowman).
Abax ater Vill. (*striola* F.). Tebay (Bowman), Clifton (Britten).
Pterostichus cupreus L. Tebay (Bowman).
P. versicolor Stm. Melkinthorpe, Strickland, Cliburn (Britten).
P. vernalis Pz. Tebay (Bowman).
P. adstrictus Esch. (*vitreus* Dj.) Ulleswater District (Rev. T. Wood), Rydal (Black), Kirkby Stephen (Thompson), Tebay (Bowman).
P. niger Schal. Tebay (Bowman), Melkinthorpe (Britten).
P. vulgaris L. Tebay (Bowman), Melkinthorpe (Britten).
P. nigrita F. Tebay (Bowman), Kirkby Stephen (Thompson).
P. minor Gyll. Witherslack (Day).
P. strenuus Pz. Tebay (Bowman), Rydal (Black), Witherslack (Day), Melkinthorpe (Britten).
P. diligens Stm. Tebay (Bowman), Kirkby Stephen (Thompson), Cliburn, Melkinthorpe (Britten).
P. madidus F. Tebay (Bowman), Kirkby Stephen (Thompson), Gaisgill, Shap (Day), Lowther, Clifton, Melkinthorpe (Britten).
Calathus fuscipes Goeze (*cisteloides* Pz.). Tebay (Bowman), Shap (Day), Melkinthorpe, Cliburn Moss (Britten).
C. melanocephalus L. Tebay (Bowman), Kirkby Stephen (Thompson), Witherslack, Shap (Day), Lowther, Great Strickland, etc. (Britten).
C. micropterus Duft. Kirkby Stephen (Thompson).
C. piceus Marsh. Melkinthorpe, Cliburn (Britten).
Agonum ruficorne Goeze (*albipes* F.). Tebay (Bowman), Kirkby Stephen (Thompson), Lowther Park (Day).

(To be continued).

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THE GEOGRAPHICAL DISTRIBUTION OF THE MOTHS OF THE SUBFAMILY BISTONINAE.

J. W. HESLOP HARRISON, D.Sc.

(*Continued from page 159*).

XVIII.—THE GENUS LOPHODES (GUENÉE).

Lophodes sinistraria (Guenée). Distribution :—South East Australia and Tasmania.

The distribution of the *Bistoninæ* has, in its study, raised a crowd of more or less difficult problems of extreme interest, but none are more attractive than the appearance of *Lophodes sinistraria* in Australia and Tasmania. Its occurrence in the Island Continent brings up a host of questions as to the origin of the Flora and Fauna of the Australian and New Zealand subregions.

Both plants and animals of the two areas show signs of long isolation from the rest of the world. In fact, no country has been separated from other quarters of the globe longer than New Zealand as the continued survival of those curious birds of the Ratite families, the *Immanes* (the Moas) and the *Apteryges* (the Kiwis) and the complete absence of mammals suggest ; these features betoken a lack of constant or reliable communications with the outer world for periods appalling in their length, for they thrust us back into Secondary Times.

Nor in Australia are things much better ; whilst it shows signs in its more lowly forms of an interchange of living beings with New Zealand, the peculiarities of its restricted Fauna and Flora, its marsupials, its weird looking monotremes of the families *Ornithorhynchidæ* and *Echidnidæ*, the persistence of its unique *Ceratodus* amongst those primitive fishes the Ganoids, its anomalous birds of the groups *Casuariidæ* (the Cassowaries), the *Dromæidæ* (the Emeus), *Cacuatidæ* (the Cockatoos), its plant orders and suborders, like the *Goodenoughiaceæ* and *Boronieæ*, all contrive to give us a picture of long separation and non-interference from outside sources.

When, however, any assemblages of undeniably southern tendencies like those birds of the sub-class *Ratitæ*, the Ostrich (*Struthio camelus*), the Rhea (*Rhea americana*), the genera *Xyleutes*, *Diptychophora*, and *Heliostibes* amongst the lepidoptera, the orders *Myrobalanaceæ* and *Stylidiaceæ* of flowering plants, showing unmistakable alliances with forms typically Australian, do crop elsewhere, they combine to demonstrate that there were, at some remote period, far-flung connections with lands beyond, but that the land-bridges lay in directions with which modern geography has no concern. They refer us to the days when the old Gondwanaland or its greater form the

Brazilo-Africano-Malagasco-Australian continent, and likewise that across the Pacific were yet in their prime. Once again we are thrown far back through Tertiary times to the mists of the Secondary Epoch. Nevertheless, the universal occurrence of fossil marsupials tells us in no uncertain voice that the last link to vanish was the old Eocene connexion with Eastern Asia.

We have thus a ready explanation of the Tropical and Sub-tropical endemic forms, but in it there is nothing explicatory of the thin—very thin—veneer of Palæarctic forms found both in Australia and New Zealand. It is very easy to say that, if such exist, the Palæarctic representatives are outliers and the Australian the original stock. Such is undoubtedly the case with very many groups as was to be expected, in view of the small dilution and the extreme age of the Australian and New Zealand Flora and Fauna, contrasted with the mixed association of sturdy virile forms which have effectually stamped out and replaced the majority of the Secondary and early Eocene genera, families and even orders in other zoo-geographical regions. Vastly different is the case here ; from its attachment to the Holarctic Realm, as betrayed by all of its present stations and migrations, and from its emphatically temperate inclinations, the Bistonine Subfamily must be of Boreal origin, and, to use a homely but expressive colloquialism, here ' the boot is on the other leg.' It is the Australian insect, *Lophodes sinistraria,* which is the outlier. Nothing proclaims this more strongly than the huge spine on the vesica of the male genitalia and the close approach of the whole genital and antennal structures to those of the early transition forms between the Boarmioid and Non-Boarmioid *Bistoninæ.*

Still, this problem of its eccentric distribution must have a solution, and this solution it is our business to find. It might be put forward that, in the consideration of the non-endemic temperate element of Australia and New Zealand, we are face to face with relics of the Flora and Fauna of the old Antarctic Continent rather than with organisms of northern origin, and, at first sight, indeed, some countenance is apparently given to such an opinion by the appearance of Alpine genera like *Erebia* (as *Erebia patagonica*) in Tierra del Fuego, and, in its modified guise of *Perenodaimon* (*Erebia*) *butleri* and *P. pluto,* in New Zealand. But it was said advisedly ' at first sight,' for *Erebia* is again a purely Palæarctic genus, and it attains a tremendous development in that region. Its presence in Patagonia and Tierra del Fuego, as well as that of our familiar little Durham speciality the Birds-eye Primrose (*Primula farinosa*) admit of the easy explanation that both passed down the lofty and continuous Rocky Mountains and Andes, for both are familiar objects in suitable portions of the Canadian Subregion. *Perenodaimon,* in New Zealand, belongs

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to the little band of which our *Lophodes sinistraria* is a representative, and when the problem of one is solved so is that of the other. Here, however, let us make ourselves clear—there must be no mistake—whilst our insect is assuredly Palæarctic, there are a few—a very few—forms of temperate habit which have been handed down through the ages from the once fertile Antarctic continent.

But it might be urged that the very reason given for the rejection of a remote southern origin of our element is precisely the explanation we require ; it may be that such animals and plants passed down the mountain ranges which form the backbone of North and South America and thence across the Pacific by some narrow belt of land in temperate latitudes. Alas, however, this conjecture, whilst falling in beautifully with the nature of the Holarctic element of South America, Australia, and New Zealand which, as we have seen, comprises only Alpine and Subalpine forms, practically demolishes itself. It necessarily demands that such forms should be alike in the two areas or one the derivative of the other, the Australian and New Zealand contingent being the derived one. What do we find ? Behold the common British Alpine and Subalpine grasses found in Patagonia and Tierra del Fuego :—*Phleum alpinum, Deschampia flexuosa* and *Agropyrum repens*. Contrast it with the following list of similar British species represented in Australia and New Zealand :—*Alopecurus geniculatus, Hierochloe borealis, Agrostis canina, Deschampia caespitosa, Koeleria cristata* and *Festuca duriuscula*. Not one is common to the two continents. Besides, many widespread genera in other groups are found in the one and are lacking in the other, e.g., the lepidopterous genera, *Argynnis* and *Colias*, occur in Patagonia and Tierra del Fuego alone, whilst the genus *Chrysophanus*, common enough in New Zealand and elsewhere in the globe, fails in the South American area in question.

Clearly, neither region obtained this feature of its Flora and Fauna from the other, and once more our dictum the elements common to South America, Australia, and New Zealand are of Secondary and early Tertiary age is confirmed.

We have incidentally elucidated the history of the Holarctic part of the plants and animals of South America without difficulty, but still no light has been thrown on that of our special quest.

The similarity of certain forms in Australia and South Africa, e.g., the temperate grasses, suggests that it might be profitable to look there for a solution, but such a search fails even more disastrously than the previous one. Not a single grass appears in both areas ; we are driven to look elsewhere.

(*To be continued*).

THE SPIDERS OF YORKSHIRE.

WM. FALCONER,
Slaithwaite, Huddersfield.

THE material for the following catalogue of spiders has been drawn from various sources. The first, of whom there is any record, to make observations on Yorkshire spiders was Dr. Martin Lister* (1638-1712), but this was in pre-Linnean days before the introduction of binomial nomenclature. Blackwall's 'Spiders of Great Britain and Ireland' † contains references to 29 Yorkshire species, 17 of which are localised, and stated with two exceptions to have been collected by Dr. R. H. Meade. The rest have neither definite locality nor collector's name assigned to them, but presumably were also taken by him around Bradford, in which city he practised; indeed the Rev. O. Pickard Cambridge has recently in the Victoria County History (1907) attributed to him and so localised 10 of them. With the exception of *Diaea dorsata* and *Porrhomma errans* Bl., all these old records have after a considerable interval been confirmed. With respect to two others, the types and other examples of which have been lost and their identity thereby obscured, but which Mr. Cambridge believes to be 'good species,'‡ there can be no doubt, I think, that *Neriene montana* Bl. = *Centromerus prudens* Camb., the former name being of prior publication, and that *Linyphia meadii* Bl. = *Oreonetides abnormis* Bl., the latter name having the priority. In the next comprehensive English work, Cambridge's 'Spiders of Dorset' (1879-1882), which includes all the then known British species, there are very few specific Yorkshire records (none of them new), for Dr. Meade apparently neither made nor published a list of his captures,§ which are stated to have included 'all the commoner and generally distributed species,'‡ 24 therein named having his initials attached. The next to resume the work of investigation was the present writer in 1894, whose efforts, at first merely local, extended in course of time in a greater or less degree to all the divisions of the county.

Although no doubt other factors are also largely involved, the geological structure of any area has much to do with the number, kinds and distribution of its spiders. Each formation has its own lithological peculiarities and particular attributes of elevation, aspect, moisture, temperature and soil, which determine the surface features and the amount and character of the covering vegetation which jointly have much influence

* De Araneis.
† Ray Society, 1861-4.
‡ *Victoria County History of Yorkshire*, p. 286 (1907).
§ Some of Dr. Meade's spiders are in the Leeds University Biological Museum, but unlocalised, and probably not all collected in Yorkshire.

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on the insect and spider life. V.C. 63, 64—Certain spiders find a congenial home only on high mountains. Of these *Diplocephalus castaneipes* Sim., and *Walckenaera capito* Westr. have been taken on the Craven hills, but the latter are apparently not lofty enough to furnish any more of the rare Alpine forms, which have occurred in more elevated and rugged regions of more ancient formations in Scotland, Cumberland and Wales. In most of the hillier districts in the west of the county also, woods are generally speaking few in number, small in extent, and with little undergrowth, stone walls take the place of hedges, and there is a scantiness in the general vegetation as compared with more favoured localities at a lower elevation. The vegetal poverty is reflected in the spider population, many of the larger and more conspicuous species, which frequent ranker growths, being absent, especially in the families Thomisidæ, Epeiridæ, Lycosidæ and Attidæ. On the other hand, the constantly moist condition of much of the ground, especially in the millstone grit areas, is particularly adapted to the welfare of very many others, while the numerous stones and the abundant heather, grass and moss shelter a large number of the smaller kinds, a considerable proportion of which are still looked upon as rare in Britain. The species which have not yet been taken in the county outside V.C. 63 are *Diplocephalus protuberans* Camb., *Tigellinus furcillatus* Menge, *Gongylidiellum latebricola* Camb., *Maro minutus* Camb., *M. humicola* Falcr., *M. falconerii* Jacks., *Eboria caliginosa* Falcr., *Thyreosthenius biovatus* Camb., *Walckenaera obtusa* Bl., *Scotina celans* Bl., *Micariosoma festivum* C. L. Koch, *Euophrys erraticus* Walck.

In 1905 Dr. G. H. Oliver forwarded a number of spiders from the neighbourhood of Bradford to the Rev. O. Pickard Cambridge for identification. These I am given to understand were not more definitely localised, and the names of 47 species he had collected, together with 10 taken by Mr. C. Mosley and my own captures up to date, were added to those recorded in the 'Spiders of Great Britain and Ireland,' and published in the Victoria County History of Yorkshire, a total of 221 species, but of these *Drassus cupreus* Bl., *Leptyphantes inconspicua* Camb., *Tmeticus neglectus* Camb., *serratus* and *adeptus* Camb., *Microneta territa* and *passiva* Camb., and *Susarion neglectum* Camb., must be expunged as they were already on the list under other names.

V.C. 61. In the autumn of 1905 Mr. T. Stainforth and a few other Hull naturalists with the occasional assistance of outside collectors, began the investigation of the East Riding, which has proved to be very rich in rare spiders. In particular, (1) the sand dune area in the S.E. corner; (2) the Humber; and (3) the uncultivated areas in Derwentland (Riccall, Skipwith and Allerthorpe Commons, Houghton Woods and moors,

etc.) have produced many species, which are found nowhere else in the county, *e.g.*, (1) *Prosthesima electa* C. L. Koch, *Protadia subnigra* Camb., *Heliophanus flavipes* C. L. Koch, *Hyctia nivoyi* Luc., *Euophrys æquipes* Camb.; (2) *Erigone spinosa* Camb., *Cnephalocotes curtus* Sim.; (3) *Scotina gracilipes* Bl., *Crustulina guttata* Camb., *Epeira patagiata* Clerck., *Bathyphantes setiger* F.O.P. Cb., while *Prosopotheca incisa* Camb., *Pirata latitans* Bl., *Hasarius adamsonii* Sav., have been taken only in other parts of the division.

V.C. 62. The Scarborough area was worked throughout 1905-6 by Mr. R. Gilchrist, and during the summers of1904-5 by the writer, and in 1913-14 by the Rev. R. A. Taylor, the result being the addition of *Coelotes terrestris* Wid., *Dysdera crocota* C. L. Koch., *Xysticus pini* Hahn and *Syedra pholcommoides* Camb. to the County list, besides other valuable records. Early in 1909, Mr. G. B. Walsh also furnished a short list for this vice-county (teste competent authorities), and the Cleveland district has since been extensively investigated by Dr. J. W. H. Harrison, and for two summers by the writer. It was found that its many dales and wide moors, especially the outlier, Eston Nab, were very favourable to spider life, amongst the species met with being two then new to Britain, *Hypselistes florens* Camb. (known previously from N. America) and *Notioscopus sarcinatus* Camb. (previously in Central Europe and since in V.C. 64) and several others not yet recorded for any other part of the county, viz., *Theridion simile* C. L. Koch, *Ceratinella scabrosa* Camb., *Cnephalocotes ambiguus* Camb., *Troxochrus ignobilis* Camb., *Hypselistes jacksonii* Camb., *Ero cambridgii* Kulcz, *Xysticus sabulosus* Hahn, *Trochosa robusta* Sim., *T. cinerea* Fabr.

V.C. 63*, 64.* Since September 1908, Mr. W. P. Winter of the Bradford Society has forwarded spiders for identification or verification, and supplied me with particulars of his own and fellow members' captures, which rest upon the authority of Messrs. O. P. Cambridge, Jackson and F. P. Smith. The writer has also paid many visits to different parts of these vice-counties. The most noteworthy species obtained were *Clubiona facilis* Camb. (F. Rhodes), new to science and a unique female, the only Yorkshire *Walckenaera obtusa* Bl., ♂, (S. Margerison) and the southern species *Micrommata virescens* Clerck, while the following have not occurred in the county outside V.C. 64; *Episinus truncatus* Walck, *Diplocephalus castaneipes* Sim., *Araeoncus crassiceps* Westr., *Walckenaera nodosa* Camb., *W. capito* Westr., *Agyneta subtilis* Camb., *Leptyphantes angulatus* Camb., *Epeira pyramidata* Clerck, *Oxyptila flexa* Camb.

(*To be continued*).

* *See* ante, p. 2.

BIBLIOGRAPHY:

Papers and Records relating to the Geology and Palæontology of the North of England (Yorkshire excepted), published during 1917.

T. SHEPPARD, M.Sc., F.G.S.

(Continued from page 171).

A. A. ELDRIDGE. See P. G. H. BOSWELL.

DAVID ELLIS. Lincs., N.
On the Jurassic Fossil Fungus, Phycomycites Frodinghamii (Ellis). *Geol. Mag.*, March, pp. 102-108.

T. B. F. EMINSON. Lincs.
The River Trent. *Lincs. Notes and Queries*, January, pp. 152-160.

JOHN W. EVANS. See P. G. H. BOSWELL.

WILLIAM GEORGE FEARNSIDES. Yorks, Derby, Lincs., Notts.
Howard Lectures on the Shortage of the Supply of Non-phosphoric Iron Ore. *Royal Soc. Arts.*, 38 pp. Abstract in *Nature*, November 22nd, pp. 234-238, and *Naturalist*, June, p. 179.

W. G. FEARNSIDES. See D. H. SCOTT.

C. I. GARDINER. Northern Counties.
The Natural History of Coal. *Proc. Cheltenham Nat. Sci. Soc.*, N.S., Vol. III., pt. 3, pp. 1-14.

E. J. GARWOOD. See ANON.

J. F. N. GREEN. Lake District.
The Age of the Chief Intrusions of the Lake District. *Proc. Geol. Assoc.*, Vol. XXVIII., Pt. 1, pp. 1-30. See also *Nature*, September 27th, p. 72.

J. F. N. GREEN. Lake District, Yorks.
Note on the Correlation of the Ingleton Slates. *Proc. Geol. Assoc.*, Vol. XXVIII., Part 2, pp. 95-97; see also *Naturalist*, December, p. 371.

H. W. GREENWOOD. Cheshire.
On an Interesting Occurrence of Secondary rutile in the Millstone Grit [abstract]. *Geol. Mag.*, May, p. 234; also note in *Lanc. and Cheshire Nat.*, February, p. 291; and *Naturalist*, August, p. 244.

J. WALTER GREGORY. See P. G. H. BOSWELL.

ROBERT HADFIELD. Northern Counties.
Introductory Address on 'Refractory Materials.' *Trans. Faraday Society*, Vol. XII. and pp. 1-32 of reprint.

J. E. HALL. Northumberland, Durham.
Natural Features in Local Place-names. *Vasculum*, March, pp. 6-12.

ALFRED HARKER. See P. G. H. BOSWELL.

H. F. HARWOOD. See P. G. H. BOSWELL.

H. F. HARWOOD. See ARTHUR HOLMES.

H. FRANK HEATH. Northern Counties.
Report on the Resources and Production of Iron Ores and other Principal Metalliferous Ores used in the Iron and Steel Industry of the United

Kingdom. Dept. of Scientific and Industrial Research Advisory Council, 1917. 145 pp.

GEORGE HICKLING. Northumberland, Lancs, S. Yorks.
A Contribution to the Micro-petrology of Coal. *Trans. Manch. Geol. and Min. Soc.*, Vol. XXXV., Pt. 4, pp. 117-138. See also *Naturalist*, Dec., pp. 370-371.

ARTHUR HOLMES. Lake District.
Albite-Granophyre and Quartz-Porphyry from Brandy Gill, Carrock Fell. With an Analysis by H. F. Harwood. *Geol. Mag.*, September, pp. 403-407.

J. ALLEN HOWE. Northumberland, Durham, Lancs, Cumberland.
The Recent Work of the Geological Survey on Refractory Materials. *Trans. Faraday Soc.*, Vol. XII. (pp. 75-77 of reprint).

J. W. JACKSON. See ANON.

OWEN THOMAS JONES. See P. G. H. BOSWELL.

T. A. JONES. Lancs. S., Cheshire.
The Pebbles of the Middle Bunter Sandstones of the Neighbourhood of Liverpool [abstract]. *Geol. Mag.*, January, p. 45.

PERCY FRY KENDALL. See P. G. H. BOSWELL.

P. F. KENDAL. See D. H. SCOTT.

W. D. LANG. Lincs.
New Cenomanian and Turonian Polyzoa [includes *Tylopora lorea* from South Elkington]. *Geol. Mag.*, June, pp. 256-258.

J. H. LISTER and J. T. STOBBS.
Lancs., Durham, Yorks., Derby, Northd.
Erratics in Coal-seams, with special reference to new discoveries in North Staffordshire. *Trans. North Staffs. Field Club*, Vol. LI., pp. 33-47.

JAMES LOMAX. See D. H. SCOTT.

JANE LONGSTAFF (*née* DONALD). Northern Counties.
Supplementary Notes on *Aclisina* De Koninck and *Aclisoides* Donald, with Descriptions of New Species [abstract]. *Geol. Mag.*, June, p. 287-288. See also *Naturalist*, June, p. 182.

T. H. MOTTRAM. Yorks., Derbyshire, Notts.
Report on the York and North Midland Division: (1) Report under the Metalliferous Mines Acts. *Quarry*, October, pp. 146-147.

A. D. NICHOLSON. Lancs.
Report on the Lancashire, North Wales and Ireland Division: (1) Report Under the Metalliferous Mines Acts. *Quarry*, October, pp. 147-148.

H. PRESTON. Lincs.
Geology [report on, principally borings]. *Trans. Lincs. Nat. Union* for 1916, pp. 19-21.

H. PRESTON and A. E. TRUEMAN. Lincs.
Oolite Grains in the Upper Lias of Grantham. *Naturalist*, July, pp. 217-218.

R. H. RASTALL and W. H. WILCOCKSON. Lake District.
The Accessory Minerals of the Granitic Rocks of the English Lake District. *Quart. Journ. Geol. Soc.*, Vol. LXXI., Part 4 (No. 284), pp. 592-622.

A. B. RENDLE. See SEWARD, A. C.

S. H. Reynolds. See under W. W. Watts.

Linsdall Richardson. See P. G. H. Boswell.

D. H. Scott. Yorks., Lancs. S.
The Heterangiums of the British Coal Measures [describes *Heterangium shorense*, sp. nov., *H. tiliæoides*, *H. Lomaxi*; form *cylindricum*, *H. minimum* sp. nov. etc.]. *Journ. Linn. Soc.* Botany, Vol. XLIV., November, pp. 59-105. See *Naturalist*, February, 1918, pp. 57-58.

D. H. Scott. Lancs., S. Derbyshire, Yorks.
The Forests of the Coal Age. *Trans. Inst. Min. Eng.*, Vol. LIV., pt. 2, pp. 33-63 [includes discussion by W. G. Fearnsides, G. Blake Walker, P. F. Kendall, James Lomax].

D. H. S[cott]. Northern Counties.
'Fossil Plants,' by A. C. Seward, F.R.S., Vol. III. [review of]. *New Phytologist*, Vol. XVI., Nos. 8 and 9, pp. 230-235; see also under A. C. Seward.

Alfred B. Searle. Northern Counties.
Refractory Materials: their Manufacture and Uses. London: pp. xii.+444.

A. C. Seward. Northern Counties.
Fossil Plants a Text-Book for Students of Botany and Geology, Vol. III., Pteridospermeae, Cycadofilices, Cordaitales, Palaeozoic Seeds, Cycadophyta (Cycadales and Bennettitales). Cambridge, pp. xviii.+656. See notice in *Naturalist*, September, pp. 273-274; also *New Phytologist* [review by D. H. S[cott]], Vol. XVI., Nos. 8 and 9, pp. 230-235, and *Geol. Mag.* [review by A. B. Rendle] in *Geol. Mag.*, November. pp. 516-518.

T. Sheppard. Northern Counties.
William Smith: His Maps and Memoirs. *Proc. Yorks. Geol. Soc.*, Vol. XIX. Part III., pp. 75-253.

Thomas Sheppard. Lincs. N., Yorks.
Illustrated Catalogue to the Museum of Fisheries and Shipping, Pickering Park, Hull. Fifth Edition, 56 pp.; 6th edition, 56 pp.

T. Sheppard. Northern Counties.
Bibliography: Papers and Records relating to the Geology and Palaeontology of the North of England (Yorkshire excepted), published during 1916. *Naturalist*, March, pp. 106-119; May, pp. 171-175.

Thomas Sheppard. Northern Counties.
British Geological Maps as a Record of the Advance of Geology. *Abs. Proc. Geol. Soc.*, No. 1008, May 24th, pp. 77-79; See also *Naturalist*, July, pp. 213-214, and *Geol. Mag.*, July, pp. 330-331, and *Museums Journal*, July, p. 16.

T. S[heppard]. Yorks., Cumberland, Lancs.
In Memoriam—R. H. Tiddeman, M.A., F.G.S. (1842-1917). *Naturalist*, April, pp. 142-143.

T. S[heppard]. Yorks., Westmorland.
In Memoriam—T. McKenny Hughes, M.A., F.R.S., F.G.S., F.S.A., *Naturalist*, July, pp. 237-238.

Stanley Smith. Yorks., Derbyshire, Northumberland, Cumberland, Westmorland.
***Aulinia rotiformis* gen. et. sp. nov., *Phillipsastræa hennahi* (Lonsdale), and *Orionastræa* gen. nov.** *Quart. Journ. Geol. Soc.*, Vol. LXXII., pt. 4, pp. 280-308.

STANLEY SMITH. See under ANON.

J. A. SMYTHE. Northumberland.
The Erosion of Rocks. *Vasculum*, Vol. III., No. 3, September, pp. 73-77.

R. STANDEN. Lancs.
[**Record of 'Calcareous Eggs of Snails occurring fossil' at Dog Holes**]. *Lancs. and Cheshire Nat.*, March, p. 316.

[H. C. STEWARDSON]. Northern Counties.
Catalogue of the more important papers, especially those referring to Local Scientific Investigations, published by the Corresponding Societies during the year ending May 31st, 1916. *Report Corres. Soc. Brit. Assoc.*, 1916, published 1917.

J. T. STOBBS. See J. H. LISTER.

A. STRAHAN [AND OTHERS]. Northern Counties.
Summary of Progress of the Geological Survey . . . . . for 1916 [refers to field work in the northern counties]. 56 pp. Reviewed in *Geol. Mag*, January, 1918, pp. 28-29.

P. W. TAYLOR. Northern Counties.
Observations on the Local Distribution of Glacial Boulders. *Trans. North Staffs. Field Club*, Vol. LI., pp. 71-75.

C. B. TRAVIS. Lancs. S.
Note on a Terminal Curvature at Billinge Hill [Abstract]. *Geol. Mag.*, January, p. 46.

A. E. TRUEMAN. Lincs.
The Lias Brickyards of South-West Lincolnshire. *Trans. Lincs. Nat. Union* for 1916, pp. 48-53.

A. E. TRUEMAN. See H. PRESTON.

G. BLAKE WALKER. See D. H. SCOTT.

W. W. WATTS and S. H. REYNOLDS. Northern Counties.
Photographs of Geological Interest—Eighteenth Report of the Committee. *Rep. Brit. Assoc.* for 1916 (Newcastle), pp. 218-237; see also *Naturalist*, June, pp. 179-180.

WILLIAM WHITEHEAD WATTS. See P. G. H. BOSWELL.

H. J. OSBORNE WHITE. See P. G. H. BOSWELL.

W. H. WILCOCKSON. See R. H. RASTALL.

A. WILMORE. Northern Counties.
The Physical Geography and Geology of the Northern Pennines. *Rep. Brit. Assoc.* for 1916 (Newcastle), pp. 398-400.

E. ADRIAN WOODRUFFE-PEACOCK. Lincs.
The Flora of Lincolnshire, Sequence-Selections. The Presidential Address for 1916 [geological notes]. *Trans. Lincs. Nat. Union* for 1916, pp. 22-40.

W. B. WRIGHT. Yorks., Lincs.
The Interglacial Problem. *Scientia* (Bologna), Vol. XXII. (August), pp. 87-94; see also *Naturalist*, November, pp. 345-346.

W. B. WRIGHT. See P. G. H. BOSWELL.

FIELD NOTES.

BIRDS.

Fatality to a Sparrowhawk.—On the 28th February, during a snowstorm, a beautiful little male Sparrowhawk killed itself by dashing against one of the windows of my house at Bayston Hill, near Shrewsbury. This is the third incident of the kind that has come to my notice.—H. E. Forrest.

Variation of the Colour of Sparrows' Eggs.—A few years ago I fitted up a row of six or seven nesting boxes under

the headstone of a window, near which my daily occupation at that time kept me. They were very readily appropriated by House Sparrows, and I had good opportunities of observing the habits of the birds. The boxes were made with a 'back door' so that I could investigate the contents from the inside of the room without disturbing the nests, and I took care to examine every nest that was made and every egg that was laid. From one of these nests I obtained the unusually-marked eggs here illustrated—taking one egg at a time at intervals, and replacing them by normal eggs taken from one or other of the neighbouring nests. In this way I got the whole clutch without inflicting any unnecessary discomfort upon the birds.—Charles Mosley, Lockwood.

Bitterns in the West.—During January and February, two or three Bitterns were seen—not shot !—in the west of Anglesey ; while another of these fine birds was shot on the Montgomeryshire border of Shropshire.—H. E. FORREST.

Bitterns have been met with in many parts of the country during the winter. Numbers have been shot, despite the Protection Acts. It is indeed a pleasure to be able to record that 'two or three have been seen—not shot ! '—R. F.

Cirl Bunting, etc., near Whitby.—A specimen of this species was seen on the road at Upgang near Whitby, on the morning of Thursday, January 10th, 1918.* It seemed only able to make short flights, but although we got very near, it always evaded capture. It has previously been recorded from this district in *Birds of Yorkshire*, p. 205. Geo. Kitchin shot a female at Fen Bogs, 28th February, 1882. Two Snow Buntings were shot at Sleights in March.—J. T. SEWELL.

Jackdaws *v.* Starlings.—A pair of starlings had made a nest in rather a large hole in a beech tree in the Church wood in the centre of Harrogate. A pair of thieving jackdaws, prospecting for a nesting site, 'hun-like' proceeded to take possession of the starlings' home. The rightful owners resisted and a battle, lasting with fluctuating fortunes on and off for two hours, resulted in the jackdaws annexing the site and ejecting the eggs. The starlings, after a valiant defence, having to retire defeated, but certainly not disgraced.—R. FORTUNE.

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ENTOMOLOGY.

Lancashire and Cheshire Entomology.—At a meeting of the Lancashire and Cheshire Entomological Society held on February 18th, Mr. Pierce exhibited a specimen of *Oinophila* var. *flavum* captured in the heart of Liverpool, *Cedestis farinatella* and *Epiblema solandriana* var. *sinuana*, from Delamere ; *Depressaria nervosa* from Sales Wood ; *Eupœcilia alismana* (*udana*) and *Schœnobius forficellus* from Tansor, Northants. Mr. R. Wilding exhibited and contributed notes upon the following species of Coleoptera all taken in his garden at Walton on the outskirts of Liverpool, viz., *Notiophilus biguttatus, Harpalus aeneus, Pristonychus terricola, Creophilus maxillosus, Philonthus laminatus, P. varians, Telephorus rustica, Afriotes sputator*, and *Coccinella bipunctata* ; he further shewed specimens of *Ptinus tectus* from the neighbourhood of the Liverpool Docks.—WM. MANSBRIDGE, Hon. Sec.

* Heavy snowstorm next day.

FUNGI.

Fungi of the Don District.—During the past season, within two miles of home, I have observed amongst others, the following :—*Amanita mappa, A. muscaria, A. rubescens, Lepiota procera, Tricholoma portentosa, T. flavobrunnea, T. gambosa, T. nuda, Russula azurea, R. rubra, Collybia radicata,* abundant in grass over tree roots ; *C. velutipes, Marasmius oreades, Hygrophorus obrusseus, H. conicus, H. psittacinus, Clitocybe nebularis,* scarce ; *C. phyllophilus,* frequent in oak woods. *C. flaccidus,* a group of six, a pretty species. *Pleurotus lignatilis,* on beech, eaten off by cattle attracted, no doubt, by the strong mealy odour ; *P. revolutus* var. *anglicus,* on willow, *Paxillus panuoides, Pholiota aurea,* a group of seven, conspicuous by size and rich hue ; *P. radicosa, Galera hypnorum, Tubaria furfuracea, Psilocybe spadicea, Coprinus comatus,* scarce ; *C. atramentarius, Fistulina hepatica,* frequent on oak ; *Poria vulgaris, Tremella mesenterica, Sphærobolus stellatus, Lycoperdon pyriforme, Arcyria punicea.*—J. H. Payne, Newhill, West Melton, Rotherham, 2nd April, 1918.

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CUCKOOS' EGGS.

In the May number, Mr. E. P. Butterfield says that he has at least found one nest with two cuckoo eggs, and there were overwhelming reasons to convince anyone that both eggs were laid by one cuckoo. It would be interesting to know what these overwhelming reasons may be, for although I have seen hundreds of cuckoos' eggs *in situ,* and many instances of two in one nest, I have never known a case of the same cuckoo twice making use of the same nest.

Each female cuckoo confines her activities to a given area as I (and others) have proved by carefully noting and comparing the types of eggs laid in each area. Two cuckoo eggs are sometimes found in one nest on the border line of two areas. It is but very rarely that two contiguous cuckoos lay eggs which resemble each other so closely that they can be taken for eggs of the same bird. I have so found them, and it needed a comparison of several eggs of both cuckoo ' clutches ' to show the difference in an almost identical type—possibly a case of mother and daughter, which was what almost certainly happened to Ray when he gave as his opinion that cuckoos might lay as many as twenty eggs from his experience with shrike dupes. The average cuckoo ' clutch ' is very difficult to determine, for one can never be certain that every egg has been discovered. I have found a ' clutch ' of twelve, and others of nine and ten. Laying will take place from the end of May to the end of July, and is curiously irregular. It is possible that in large ' clurches ' there is much that is akin to the ' double-broodedness ' of other species.

I have used the word ' clutch ' in inverted commas for no real reason. The cuckoo lays a clutch as other birds do, but scatters it about.

E. E. Pettitt.

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The authorities of the Natural History Museum sent the Lord Mayor of Hull a portion of whale flesh from the whale stranded at Battersea recently, and have drawn the attention of the Ministry of Food to the value of whale flesh as food. The Lord Mayor remarked, ' The whale steak we had for lunch was delicious. We all enjoyed it very much."

REVIEWS AND BOOK NOTICES.

Memorials of a Yorkshire Parish. by **J. S. Fletcher.** London: John Lane, 225 pp., 7/6 net. Mr. Fletcher has put a powerful microscope upon the village of his boyhood, and after a careful search reads a summary of the history of the country, illustrated by a few buildings and records of this particular place. He tells us what the village was probably like during the various periods of English history, and makes the most of the relics remaining relating to the parish. He seems so have ransacked every likely source of information, with the result that we learn from the publisher's announcement, that 'This is an historical sketch of the parish of Darrington, dating from the time of Edward the Confessor. The immediate surroundings of this parish are full of historical and romantic interest, and the author gives us the outstanding historical figures and epoch-making events of each century. The narrative is of absorbing interest, and highly instructive.' There are reproductions of thirteen drawings of the Church, etc., by G. P. Rhodes, who has attempted to copy the style of the well-known sketches of Herbert Railton.

My Life as a Naturalist, by **W. P. Westell.** London: Cecil Palmer and Hayward, 268 pp., 7/6 net. When we received a volume with a gaudily-coloured cover, upon which was a frog on its hind legs, in a 'Come-sing-to-me' attitude, 'making eyes' at a 'painted lady' with bright blue eyes, and with a monstrous grub standing erect on its head—or tail—and headed 'My Life as a Naturalist,' we feared a mistake had been made in sending the book to this staid journal; that it really related to a 'bird,' and was intended for one of the frivolous weeklies. The title-page, however, showed that the volume was an account of W. P. Westell, written by W. P. Westell, and with W. P. Westell's portrait and signature as frontispiece. Then follows an 'Introduction' by the Earl of Lytton, a reprint of a poem by Rudyard Kipling, another by C. S. Frethey, and then the 'Life' itself. But who on earth, in these times, wants to know anything of the life of W. P. Westell? Personally we should much prefer to read an obituary notice of him; it would be shorter, and from a different point of view. We have perused the book in the hope of finding some scientific achievement worthy of record, but in vain. However, as he informs us that Darwin was an undergraduate, and Franklin was 'a misfit in his father's shop' (and both Darwin and Franklin became great men), apparently Mr. Westell thinks the world is thirsting to know what moulded his career. He considers that his 'inherited character is directly traceable' to two previous Westalls, or Westells, one a great artist and the other a great poet. W. P. Westell has certainly written a 'poem,' which begins with the original observation 'Hark to the joyous lark.' This he gives us again, though we had seen it previously; and evidently one person 'appreciated' it, and we are given the appreciation. We hope, however, that his poetic ancestor is in no way responsible for 'Hark to the joyous lark.' As to W. P. Westell's 'literary activities,' he tells us that at the age of 14 he published his first article in a newspaper, and that recently, at 43, he has published his '50th book.' We fear Mr. Westell's opinion as to what a 'book' is differs from our own; at any rate in Mr. Westell's own lists of Mr. Westell's own books, which should be reliable, we can find nothing like that number. Briefly his life as a Naturalist consists of the fact that at first he loved birds; later, almost anything that he could write about in his books; that he has played cricket and football (he doesn't say whether he ever played 'rounders'); that a relative taught Queen Victoria painting; that he has had a letter from 'Queen Mary' about his Uncle, and one from the Town Clerk at Oxford on a similar subject; he once showed some photographs at a Royal Society Conversazione; in 1911 natural history saved him from a permanent mental breakdown (we are sorry to hear of this) and so on. The book is illustrated

by some very third-rate sketches, one of which, entitled 'Daisies are—daisies' tempts us to add 'except when illustrated in Mr. Westell's book.' The volume is dedicated to 'the Dowager Countess of Lytton as a token of affection and regard,' and to her he says: 'A look—and lo, our natures meet! A word—our minds make one reply! A touch—our hearts have but one beat!' Our sympathies go with the Dowager Countess of Lytton, though it must be nice to know that her heart 'beats as one' with that of an 'author' with 'literary attainments,' such as W. P. Westell. Thank heaven her heart has not to keep time with the beating of his drum or the blowing of his trumpet.

An Elementary Textbook of Entomology, by **Dean E. Dwight Sanderson** and **L. M. Pearis.** New York: John Wiley, and Sons, Inc.; London: Chapman and Hall, Ltd., price, 7/-. This is one of the American Technical Series of Books, and as the Introduction tells us, is intended as a textbook for Secondary Schools. It is a good book, and the first thought that strikes us on going through it is, that if there is a sufficient demand among Secondary Schools to make such a book pay, Entomological Science in American schools is far ahead of what it is in England. Any student, having studied this book thoroughly, could not fail to be possessed with an excellent ground knowledge of entomological science generally, and with any inclination in that direction could pass on at once to a deeper study of any special branch of the subject. We know of no entomological textbook in our English schools at all comparable to it, though botanical students do perhaps fare better. The publishers evidently contemplate a demand for the book in the United Kingdom, so is it too much to hope that our Educational authority will sometime wake up to the necessity for a far better groundwork in natural history science than they have hitherto had any idea of? From a hygienic point of view alone it would be worth while, as no study takes one so much into the open air, and induces such recreative thought, as does that of natural history science. The book is divided into two parts of almost equal size, the first treating of 'General Entomology,' the other of 'Economic Entomology.' In the first we have simple but clear and concise accounts of the Structure and Development of Insects, followed by separate chapters on each of the orders contained in Class Insecta, written in an interesting and fascinating way for students, and in which accuracy has evidently been made a special feature. We do not care for the arrangement of the various orders in their relation to each other, as it differs from generally accepted English notions, but that is a matter of sentiment and we are by no means at one on the matter at home. The table for the separation of the Orders is very good. A statement at the beginning of the chapter on Coleoptera was a surprise to us. We read that 'Entomologists have, almost since the beginning of the science, shown a decided preference for the beetles.' This may be because the American beetles are often so much larger and showier than British species, but here the lepidopterists have certainly always largely preponderated in numbers over the coleopterists. The second part, 'Economic Entomology' contains six chapters devoted to 'Insects affecting Man and Domestic Animals,' 'Insects affecting Man and Stored Food Products,' 'Field Crop Insects,' 'Garden Insects,' 'Orchard Insects,' 'Insect Control.' These contain the life histories of the numerous insect enemies of Man, Domestic Animals and Plants, with the necessary information to prevent their attacks; and when attack has already been made, the remedies to be applied to get effectually rid of it. If every young farmer and horticulturalist had to make a study of this course alone, it is impossible to estimate the enormous saving which would be effected, especially in grain crops, and very largely also in cattle and vegetables. We are told that the Cattle Tick alone is responsible for the loss of over 63 million dollars annually in the Southern States, and that the Hessian Fly reduces the wheat crop 10 per cent. every year, and that 25 to 50 per cent. is frequently lost in

restricted localities. The extent of insect injuries in the United States has been carefully estimated by the U.S. Department of Agriculture at the stupendous annual total of one billion dollars. Of these, grain and forest crops are the heaviest sufferers, bearing about one third of the total, though the live stock injury amounts to almost as much. The book is well and numerously illustrated, and the paper, printing and binding, neat and good. There are a very few errors in spelling, etc., which ought to have been avoided in a book for schools. On page 48 we find 'typically' for 'typically;' on page 68 'rivaled' for 'rivalled'; 'the' occurs in duplicate on the top line of page 51, etc. Besides these there are a number of common words which are by the Americans ordinarily spelled differently from our method. There ought to be a big demand for the book, not only by Schools, but by farmers and agriculturalists of every kind.—G. T. P.

——: o :——

The elaborate catalogue of Roman Pottery in the Carlisle Museum, prepared by Thomas May and Linnæus E. Hope, reprinted from the *Transactions of the Cumberland and Westmorland Antiquarian and Archæological Society*. is on sale at the Museum at 1/-.

In *The Journal of the Board of Agriculture* for April are the following papers:—'Bracken as a Source of Potash,' by R. A. Berry, G. W. Robinson and E. J. Russell; 'Rats: How to exterminate them,' by R. Sharpe; and 'The Control of Pests of Fruit Trees in Gardens and small Orchards.'

The Transactions of the Cumberland and Westmorland Antiquarian and Archaeological Society, Vol. XVII., recently issued, contain a paper on the Lancaster Canal (with contoured map) by J. F. Curwen, and a valuable 'Catalogue of the Roman Pottery in the Museum, Tullie House, Carlisle,' by T. May and L. E. Hope. It is illustrated by 19 plates.

The Quarterly Journal of the Geological Society, No. 289, recently issued, is gradually bringing the Proceedings of this important Society up to date. It records the Society's work between November, 1916, and June, 1917. Besides Dr. A. Harker's presidential address, there are three very important papers, namely, 'On a Second Skull from the Piltdown Gravel,' by Dr. A. Smith Woodward, with an appendix by Prof. G. Elliot Smith; 'Lower Carboniferous Spilites from Derbyshire,' by Mr. H. C. Sargent; and 'Morphology and Development of the Ammonite Septum,' by Prof. H. H. Swinnerton.

We have received part 1 of Volume XVII. of the *Transactions of the Hertfordshire Natural History Society and Field Club* (64 pp., 2/6). The editor, Mr. John Hopkinson, contributes three papers on Meterological and Phenological Observations. Other items are the American Poison-Vine, *Rhus toxicodendron* at Bushey by L. P. Shadbolt; Botanical Observations in Hertfordshire during the year 1916, by E. J. Salisbury; *Pisidium parvulum* in Hertfordshire, by Charles Oldham; Notes on Birds observed in Hertfordshire during the year 1916, by William Bickerton; and The Ecology of Scrub in Hertfordshire: a study in Colonization, by E. J. Salisbury, as well as entomological and ornithological notes.

The Transactions of the Geological Physics Society, 1915-17 (16 pp., 1/-), are rather meagre, possibly on account of the war. They contain a list of the officers and members (37) and the balance sheet shows that the Society has 5½d. in hand. There is an account of a General Meeting held in London on May 25th, 1917 (4 pages) the remainder of the publication being occupied by reprints of articles appearing in *Nature* on the Origin of Flint. Seeing that the Society's publication is so small we think it is a pity that so much of it should have been occupied by information which can be readily obtained by every member from *Nature*. As the list of members contain such names as George Abbott, E. K. Robinson, J. V. Elsden, W. F. Gwinnell, C. Carus-Wilson and Lord Clifford of Chudleigh, it can hardly be that the Society was short of contributors.

NEWS FROM THE MAGAZINES.

Belfast Museum Publication No. 68 deals with 'The Seed and the Young Plant,' and is sold at 1d.

'Notes on the British Species of *Sphæriestes* Steph,' by K. G. Blair, appear in *The Entomologist's Monthly Magazine* for April.

A Short History of the Study of Mycetozoa in Britain, by Miss G. Lister, appears in *The Essex Naturalist*, Vol. XVIII., parts x.-xi.

The New Phytologist issued on May 6th contains an illustrated paper on 'The Origin and Development of the Compositæ,' by James Small.

The Journal of Conchology for May contains 'Researches into the Hereditary Characters of some of our British Mollusca,' by A. W. Stelfox.

The Animal World for April contains notes on 'The Mysteries of Migration' by Donald Payler, with an illustration of Bird Rests on Lighthouses.

Records and descriptions of some British *Campodeidæ*, including many northern examples, by R. S. Bagnall, appear in *The Entomologist's Monthly Magazine* for May.

The Irish Naturalist for May contains 'Irish Fossil Mollusks,' by R. Lloyd Praeger, and '*Limnæa glabra* in Ireland?' by J. Wilfred Jackson, with a note by R. A. Phillips.

Mr. J. de W. Hinch, in his Presidential Address to the Dublin Naturalists' Field Club, dealt with the 'Development and Decay of the Irish Sea Glacier,' and his paper appears in *The Irish Naturalist* for April.

In *The Scottish Naturalist* for May, Dr. W. E. Collinge writes 'On the Value of the Different methods of estimating the Stomach Contents of Wild Birds,' and Mr. W. Denison Roebuck on '*Limnæa glabra* as a Scottish Mollusc.'

The Journal of the Manchester Geographical Society issued in April contains Prof. G. Elliot Smith's addresses on 'Ancient Mariners,' and Mr. Harry Sowerbutts's report on the Conference of Corresponding Societies, British Association, held in London last year.

Mr. C. W. Colthrup concludes his 'Observations on Birds' Songs and Calls' in *Wild Life* for March; Mr. E. E. Pettitt, the Editor, continues his notes on 'Birds of North-west Surrey'; Mr. C. R. Brown gives 'An Episode in the Life of a Green Woodpecker,' and there are short notes on various Cats by Dr. F. D. Welch.

Country Life recently has had some papers by Mr. Riley Fortune, illustrated by his inimitable photographs, some of which have a distinct bearing upon Yorkshire. The issue for February 2nd contained his notes on 'St. Cuthbert's Duck'; February 16th, 'The Roseate Tern'; March 9th, The Guillemot on the North East Coast; and April 6th, the 'Otter.' *The Badminton Magazine* for February also contained an illustrated article of his on 'The Avocet in Holland.'

British Birds for May contains a paper on 'The Effect of the Winter of 1916-1917 on our Resident Birds,' by F. C. R. Jourdain and H. F. Witherby; a report on the 'British Birds Marking Scheme'; 'Some Manx Notes,' by P. G. Ralfe; also records of Yellow-browed and Barred Warblers in Lincolnshire in 1915 and 1916, and large numbers of Red-throated Divers in North Lancashire.

The Journal of the East Africa and Uganda Natural History Society for February (Longmans, Green & Co., 5/4) contains a coloured plate of *Francolinus nahani*, and a number of short notes, as well as the following papers of more general interest, the first of which is well illustrated and exceptionally interesting: Some Notes on the Early Hominidæ, by Dr. E. Wynstone-Waters; The Migration of Birds, by Dr. V. G. L. van Someren; The Game Fish of Mombasa, by E. K. Boileau; Geological Exploration, North frontier district, by the editor, C. W. Hobley; On a Collection of Birds from Lamu and District, made by Mr. H. J. Allen-Turner, Dr. van Someren; Kikuyu Ithathi, by H. R. Tate; Another Rare Forest Francolin, by Dr. van Someren.

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June 1st, 1918.

JULY 1918. No. 738
(No. 512 of current series.)

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A MONTHLY ILLUSTRATED JOURNAL OF
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Eastbourne Naturalist (1 part).
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Huddersfield Arch. and Topog. Society. 1st Report, 1865-1866. (38 pp.).
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North Staffordshire Field Club Reports for 1869, 1871-2, 1876.
Reports on State of Agriculture of Counties (1790-1810).
Royal Cornwall Geological Society Trans. Vol. V. to date.
Salisbury Field Club. Transactions, Vol. II.
Scottish Naturalist. 1881-1891.
Simpson's Guide to Whitby. 1st ed. [before 1881].
Smith's New Geological Atlas of England and Wales. 1819-21.
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NOTES AND COMMENTS.

THE BRITISH ASSOCIATION.

It is perhaps some indication of the signs of the times that the Annual Report, which is just to hand, of the British Association for the Advancement of Science for the year 1917, is by far the smallest report that has been published since the Society was founded in 1831. Probably at no period in the history of this country has the necessity arisen for the encouragement and advancement of Science as during the past year or two, and for the first time in its history the one important Association, with the Advancement of Science for its sole object, has cancelled its Annual Meeting, resulting in the publication of the brief report which contains an account of the work of some of the Committees which still carry on, notwithstanding the bad example set by the Association itself. Of course, it is understood that in these times there are difficulties in the way of railway travel, hotel accommodation, and what would seem necessary, entertainment for the members, but there is no reason whatever why a few days should not be devoted to solid Scientific work at one or other of the homes of the various Scientific Societies in London, any or all of which would have gladly been placed at the disposal of the Association. We believe that every other important Scientific Society in the country has 'carried on' since the war; many have unquestionably been of great service in the present crisis. It is not flattering to the members of the British Association for the Advancement of Science to be told that no meetings are taking place.

AND ITS REPORT.

The volume contains the Twenty-second Report on Seismological Observations; a Preliminary Report on Terrestrial Magnetism, the First Report on Colloid Chemistry and its Industrial Applications, Report on the Nomenclature of the Carboniferous Rocks, etc., of the Southern Hemisphere (part of which is headed 'Engineering Problems'), a brief summary of 'Engineering Problems affecting the Future Prosperity of the County,' the full report of which is not printed, but placed in the offices of the Association; brief reports on a Palæolithic site in Jersey and the Mammalian heart respectively; and a lengthly report on Science in Secondary Schools. There is also the Report of the Corresponding Societies' Committee, already recently referred to in these pages.

EARTHLY v. HEAVENLY WISDOM.

We are not regular readers of *The Bible Students' Monthly*, but somehow No. 1 of Vol. IX. of this journal has reached us. On the front page, under the above heading, is the following

extraordinary effusion :—' According to Evolutionists, Nature is a great impersonal God, whose first production of life on the earth was in the form of protoplasm. After thousands of years, they say an ambitious family of protoplasm evoluted and became tadpoles. For some thousands of years the tadpoles reigned as an aristocracy of the earth ; and then an ambitious family of tadpoles concluded to evolute and become frogs. Thousands of years later there arose an aristocracy among the frogs, which evoluted and became monkeys. After other thousands of years an aristocracy among the monkeys evoluted and became college professors ; and that is the attainment of our day. In answer to our queries they boast of their ancestry and also of their posterity, telling us that, in perhaps a million years in the future they will live everlastingly in a representative sense in that their children will have evoluted to a condition of wisdom and discretion wherein they will not need to die.' The writer then blandly adds :—' Contrast this nonsense (*sic*) the wisdom of this world, with the Wisdom from Above, which tells us the opposite.' We are not aware of the source of the writer's ' wisdom of the world,' but we have never read such blithering piffle for some time. It may do for the ' International Bible Students' Association,' and if they are satisfied that this is a sample of worldly wisdom, they are no doubt glad to fly to the ' Wisdom from Above,' whatever that may mean. The author gives a sample, but we dare not read it lest his ignorance of Wisdom from Above may be on a par with that of his conception of earthly wisdom, in which case we might be profane.

SOCIETIES AND THEIR MANAGEMENT.

We have a way of doing things in Yorkshire which is happily different from that which obtains in the south. When a particularly prominent member of any important society feels that he has ' done his bit,' or if he thinks his colleagues have that impression, he retires ; and such a change is often good for a society. If, as has happened, an official refuses to take a hint, another is appointed ; the official may leave in disgust, but the society still goes on, perhaps better than before. But something very drastic would have to happen to enable a new County naturalists' society to be formed in these times ; yet this is practically what has happened, for some cause or another, in the south.

GILBERT WHITE SOCIETIES.

We do not, of course, know that the cause is anomosity towards any particular official, and we can hardly believe that there is anything against the energetic Secretary of the Selborne Society, who has done more than most people, even the members themselves, are aware, to further the Society's

aims. Nor can we believe that desire for greater prominence in a new society than was possible in the old could be the cause of any ladies and gentlemen deserting one society to form another with apparently identical aims. But the fact is that two societies now exist to perpetuate the name and work of Gilbert White of Selborne, and, with all due respect to that great naturalist, we consider that one society is sufficient for the purpose, and think that the two organisations would be more likely to carry on his excellent work were they to join forces.

THE SELBORNE SOCIETY.

The Selborne Society, founded in 1885, has carried out its work and published its little magazine with great regularity ever since. Last year it adopted the Companies' Act, became 'The Selborne Society, Limited,' the elaborate Memorandum and Articles of Association of which are before us. Apparently the membership is considerable, and the lists of vice-presidents, etc., contain the names of many well-known scientific workers. Recently the Society has taken an interest in popularising scientific lectures.

THE GILBERT WHITE FELLOWSHIP.

On April 20th last the 'inaugural meeting' of the Gilbert White Fellowship was held, and judging from the wealth of printed matter the society has issued it is at present 'going strong.' Before the 'inaugural meeting' a printed list of proposed officers, honorary members, rules, etc., was issued, so that the status and character of the Society and its members were fairly well defined before its inception. Among the names we notice several which already appear in the lists of the Selborne Society, so that the new 'Fellowship' cannot have been formed in ignorance of the existence of the old one. The 'objects' of the Fellowship are 'To continue the work of Gilbert White in the study of Natural History and Antiquities'; the objects of the Selborne Society are to 'perpetuate the memory of Gilbert White' and 'to promote the study of Natural History and Antiquities.' But there is not room for two societies having practically one object, and sooner or later one, if not both, must suffer.

PUBLICATIONS.

The new Fellowship has elected an 'Hon. Editor' so that presumably another Selborne Magazine—or some such publication—is on the way. With regard to this it is of moment to notice that in view of the extra cost of printing and scarcity of paper the organ of the Selborne Society will appear less frequently, of smaller size and without a cover. Long articles are to be dispensed with and the detailed programme of rambles will be issued as a supplement. This is announced in

the twenty-ninth volume. No. 339, recently to hand, is for March-April, contains eight pages, and is sold at 3d.; three-half-pennyworth of which is occupied by a paper on 'Means of Seed Dispersal, Direct, Colateral and Secondary Bird Carriage,' by the Rev. E. Adrian Woodruffe-Peacock.

SOUTH-EASTERN NATURALISTS

We were privileged to attend the twenty-third Annual Congress of the South Eastern Union of Scientific Societies, which was held in London during the four days ending June 1st. It was well attended, interest in the meetings and jaunts was well maintained, and the Union once more demonstrated the advisability of 'carrying on' during the present war. Besides the Presidential address of Sir Daniel Morris on 'A Chapter on the Geographical Distribution of Plants,' there were papers on 'Roman Mints in South-Eastern England' by P. H. Webb; 'Mosquitoes in England,' by Sir Ronald Ross; 'Meteorological Instruments, and how to read them,' by R. Corless; 'The Geology of Flint Implements,' by Reginald A. Smith; 'Allotment Pests,' by R. W. Ascroft.

AND THEIR EXCURSIONS.

There were some delightful 'outings.' These included a visit to St. Bartholomew's Church; the admirable and well-arranged Horniman Museum at Forest Hill, where the Curator Dr. H. S. Harrison, gave an address; to the Charlton Pits and ancient Camp (conductor, Mr. W. Whitaker, F.R.S.); to the New Transport Co's Works; Kew Gardens and Herbarium, under the direction of Prof. G. S. Boulger; and to Messrs. Siebe Gorman & Co's works to examine Diving and Mine-Rescue apparatus.

LITERATURE.

There was an abundance of literature. Besides the circular convening the meeting, there was the Daily Bulletin (4 or 8 pp.), five of which were issued; tickets and admission cards galore. In addition each member was presented with a bundle of reprints containing a Prospectus of 'A Survey of Woolwich,' issued ten years ago; a review of Prof. J. W. Carr's Invertebrate Fauna of Notts, published in 1916; Catalogue of the South-eastern Union's Library in 1912, with lists of additions since made; the Report of the Botanical Section, reprinted for the Society's Transactions for 1917, etc. The charge of 1/- which was made for each excursion was a little difficult to understand seeing that each visitor paid for his own refreshments and railway fare, and the guides gave their services; possibly the money went towards the printers' bills. On one occasion a check was made and the number of persons present who had not obtained tickets resulted in a nice little sum being added to the funds!

THE BULLETIN.

The idea of a daily Bulletin, after the manner of the programmes issued by the British Association, was a good one; but sometimes the apparent necessity for filling the four or eight pages seemed to result in irrelevant matter being introduced. From these we learn that the newly formed Gilbert White Fellowship is '*vigorous*'; that 'Regional Surveys will undoubtedly loom very prominently in the public eye when the war is over,' 'What is a Controller? One who tries to Control, and sometimes succeeds. We want a Controller of Weather. But it would not be an enviable post, and the Editor would not be a candidate for it.' [Perhaps he can't control]. 'The Lord Mayor regaled himself on eight pounds of the flesh [of a stranded whale] and pronounced it to taste like tender beef steak. We wonder how many coupons he surrendered for it.' 'What peace has failed to do the war has perforce necessitated. Shall we ever return to pre-war conditions? In many respects we trust not.'

WOMAN: PAST AND PRESENT;

The following extract from this Bulletin makes us assume that the editor, who is admittedly only an 'Asst. Commander,' is a married man:—'That much in the future depends on how woman uses the power which has lately become hers, will be admitted by all, but will she retain her 'womanishness' whilst taking part in so many walks of life from which she had hitherto been excluded? In achieving her independence, is there not too much imitation of the man she is supplanting? Is she using her power to transplant into social life her own way of doing things, and so to introduce novel methods to reform the chaos made by man? Slavish imitations must cease. In the new times ahead we must cast off our swaddling clothes and our misfits. The woman in power must not become the tyrant which man in power has proved himself to be. Much depends on whether woman in power becomes a slavish imitation of man, or remains a psychic centre of power transferred to a new and promising centre of activity. In spite of all the efforts of reformers and the dreams of poets, might is still too often right. The animal side of humanity too frequently still prevails over the psychic side. When one would do good, too often evil is still present. Mankind's lowly origin still betrays itself as frequently as ever. Will human nature never change? Why not? What an opportunity there is for womankind in the future! Animal passions can never be wholly suppressed, otherwise a nation will commit suicide. But there is room for more of the psychic element, and we can drop much of the animal element without loss.'

AND MAN.

In another Bulletin the editor informs us: 'Many people stand aghast at the havoc of the present war, and ask is it this to which civilisation has been tending during the centuries that have gone? Progress has been so rapid that they regard this war as something which is likely to destroy civilisation. Are they not short-sighted? The war is a set-back, a terrific one, certainly. But is it not better to regard it only as a temporary set-back? Think of the 400,000 years of paleolithic times during which progress was so slight, and during which, as we know, there were such serious cultural set-backs. And yet the sum-total has been progress. The human race takes two steps forward for every one backward: we can never again become in the condition of primitive man. Let the faint-hearted take courage. Backward though we seem to be going just now, and it will be admitted that civilisation is checked for a time, there can be but little doubt that the recovery will be rapid, and that there will be giant-strides in the evolution of civilisation in the near future. Man's evolution is still incomplete. He is being weighed in the balances, but we can never admit for a moment that he is being found wanting.'

CHEIRANTHS—A PARABLE.

Ineffable magic of Perfume blent
In butter-blake petal or dyed as with blood,
To pile up a posy that blesses through scent,
While spread like a Carpet of Ind on the rood!
'Wall-flowers' homely!—no trove from afar,—
But 'Warriors'* waging a year-long War
With Winter that ever Spring routs completely,
As Hope—heart's lark!—mounts high and sweetly.

Aught beyond this shall our fancy say,
To be true to the fact and the feeling? No,
All's told in a term—'Tis the Season's 'Way,"
Earth's comfort conveyed in an Odour, so!
Hand-flowers! † badge of the Quick and the Brave!
Plant, an' you will, on the Soldiers' grave;
But, look to it—keep you the Home plot aflower
For who'll stand by it with you in Victory's Hour.

No more than the skies, at a country's Call,
Are *all* in 'the good fight' known to fall:
Look forward in trust through the perfumed portal,
And know that a God made Hope's Immortal.

F. Arnold Lees.

* The rustic's name all over the south of England, and Blake is the yellow 'lake' of dye used in cheese and butter making.

† The generic term, englished.

Neolithic Flint Implements from Scunthorpe.

NEOLITHIC SETTLEMENT NEAR SCUNTHORPE, LINCOLNSHIRE.

(With Plate III.)

HAROLD E. DUDLEY, Hon. Curator.
Scunthorpe Council Museum.

For a number of years the flint implements of the Scunthorpe district have been well known, especially the so-called 'Pygmy' flints. The publicity given to this small type of implement has attracted various scientific societies and collectors of note to the Neolithic settlement on Risby Warren, resulting in the publication of some information regarding the encampment and

Small circles :—**Sites of hearths.** Black circle :—**Rubbish heap.**
Shaded portion :—**Strewn with fragments of pottery.**

its flints. As the present writer has been constantly visiting the Warren during the past fifteen years, and has there picked up many hundreds of worked flints, it may be that these present notes will add something to what has already been recorded.

This settlement, known locally as the 'Camp,' part of which is shown on the plan given herewith, is situated on the brow of the 'Cliff,' a prominent Oolitic ridge dipping steeply down on the western side and sloping gently towards the valley of the Ancholme on the east. The summit of the hill is covered with a considerable depth of blown sand, which,

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being driven hither and thither by the varying winds, has been heaped into hummocky hillocks and hollows, somewhat resembling the sand dunes of the sea coast. A few scattered trees, chiefly elder, maintain a precarious existence before eventually succumbing to the undermining of their roots by the wind and rain, which are gradually removing the loose, sandy surface to the valleys below. Bracken is the chief cover of the higher ground, where rabbits abound. Lower down, thick with rushes and mosses, are marshy levels and shallow pools, the haunt of the moor hen and black-headed gull.

Underneath the yellow surface sand of the 'Camp' is a layer of dark peaty sand, from which most of the flint implements are obtained, and when this in its turn is removed in the general denudation, patches of loose Oolitic rubble are exposed.

Crossing the plan is a long bank or wall. This earthwork is composed mainly of Oolitic debris, and considerable numbers of implements have been picked up from its sloping sides. The large circular mould just outside the wall is roughly about seventeen yards in diameter by about five feet high. It is remarkable for the quantities of rough implements of white flint which are from time to time exposed, and these are of quite a different character from any found elsewhere on this settlement, being of an altogether rougher type. Both the earthworks in question are undoubtedly of artificial origin, but the writer prefers not to speculate as to the time or nature of their construction.

The outlook, from a defensive point of view, could not be much better. On the one hand are extensive views of the Ancholme Valley as far as South Ferriby and Brough on the Humber, and on the other is an uninterrupted view right across the shelving plain formed by the Frodingham Ironstone to its outcrop above the river Trent. The steep hill on the western side would be an important factor in the successful defence of the place.

The whole district for several miles around Scunthorpe is fairly rich in Neolithic implements, but these occur chiefly as isolated, finished flints, whereas the Risby Warren site is notable for the large numbers of cores and flakes which are obtained. There can be little doubt that this settlement was to all intents and purposes a factory which supplied the surrounding country with warlike and domestic implements, and evidently each man, or group of men, specialised in a particular type of implement. One individual was apparently a veritable artist in the manufacture of 'Thumb-flints,' another turned out quantities of delicate, pointed borers, and yet another fashioned rough scrapers of quite a different type. The writer

formed this opinion some years ago, and his view has been confirmed on subsequent visits. Each locality has its own particular class of implement. Here, on a little patch of ground a few feet in extent, scores of shouldered borers have been picked up; there, have been gathered large numbers of small scrapers, and yonder; quantities of flaked knives. It may be argued that these are simply hoards, but against this theory may be placed the fact that together with these implements are also found cores and flakes of the same flint, in addition to partly finished implements, which appear to have been broken or spoiled in the making, and then discarded.

The sites of a number of hearths are shewn on the plan. These were in some cases discovered by the writer immediately after the overlying sand was removed by the wind, and in others during the actual process of being uncovered. Traces of charred wood were observed, and numerous fragments of early British pottery, many of them ornamented, were found in close proximity to the hearths, together with numbers of scrapers, knives, etc., and occasionally arrow or lance-heads, hammer-stones and rough celts. The ground underneath the fires was in each case baked quite hard, remaining as a small hillock or cone long after the surrounding and more loose material had disappeared.

The black circle to the north of the plan is a small mound consisting almost entirely of fragments of pottery, intermingled with blown sand. The pieces of earthenware are so numerous as to suggest a rubbish heap.

The chief characteristic of the Scunthorpe flints is their beauty of execution and finish. They are in most cases small, some of the arrow-heads, in particular, being very diminutive. The largest implement which the writer has yet found is a flint knife three inches long. Small semi-circular scrapers or 'Thumb-flints' abound. The conchoidal depression to be found on many of them fits the thumb, allowing the user to get a firm grip of these workmanlike little implements. It is not unusual to carry home fifteen or twenty 'Thumb-flints,' provided the searcher knows where to look!

Arrow and lance-heads are rare, but the majority found are beautifully made. The type shown on the top right-hand of the plate seems unusual.* Many other types of implements are obtained, such as hollow scrapers, 'fabricators' and rough spear-heads, together with forms which it is not easy to classify.

The so-called 'Pygmy' flints have been diminishing greatly in number during recent years, until at the present time one or two specimens is a good average 'find' for each visit. These tiny implements are manufactured from small flakes, the

* It is represented in the Mortimer collection, now at Hull.—Ed.

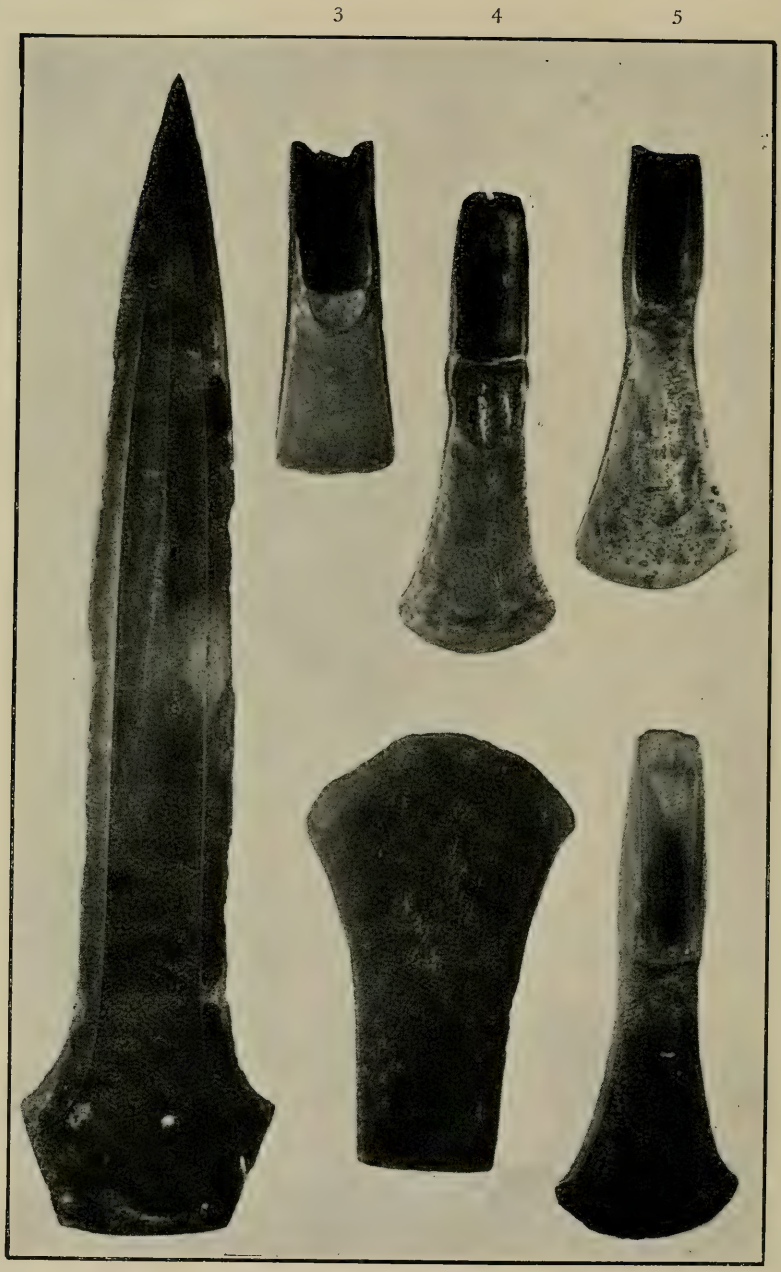
thicker edges of which are minutely worked, the natural edges being left untouched. Most of the various well-known forms have been found on the Risby Warren, the tapering, shouldered variety predominating.

The hammer-stones previously referred to are improvised from small glacial erratics, which are strewn in quantities over the surface of the Ironstone area. Several of these small boulders, flat and elongated, have been ground at the ends to a cutting edge, forming implements which have characteristics belonging to both the hammer-stone and the finished celt. Some polished celts have also been found, and may be seen in the Scunthorpe Museum, together with a large collection of flint implements.

It will be seen from the foregoing notes what a 'Happy hunting ground' Risby Warren is. The fascination of flint hunting on its wind-scarred slopes is heightened by the spice of uncertainty which surrounds the place. A little patch of ground, discovered by some lucky chance, may continue to yield its implements for some time, when, with a sudden turn of the wind, it is gone, buried inches deep in the driven sand.

——: o :——

Food of Tawny Owl.—I have been to-day to look at the nest of a Tawny Owl built on the ground in the Gait Stock Valley, which contained two young ones. They were lying just outside the nest, the hindquarter of a young Mistle Thrush, the hindquarter of an adult Song Thrush, the hindquarter of a young rabbit, two Common Shrews, three Wood Mice, two of which were headless, two Field Voles, and one which I take to be a Bank Vole. It may be, however, a variety of the Field Vole, but it has a relatively longer tail, and the colour of the buck is redder than the typical Field Vole and is somewhat smaller. It used to be thought that Owls would not eat the Common Shrew, but I can hardly bring myself to believe that these had been brought to the nest, presumably by the male bird, other than for a utilitarian purpose. I suggested that the Food Controller ought to be sent to limit its prey, at least to the furred tribes. It will take a number of years—and favourable years—before we can hope to see many of our resident birds—especially the Song Thrush (the hardest hit bird in this district by the winter of 1916-17 in their normal numbers. The only other instance of the Tawny Owls' nesting on the ground in this neighbourhood was in a rabbit burrow, but this was over twenty years ago. One could not have wondered at this, had there being a lack of more natural breeding places.—E. P. BUTTERFIELD, Bank House, Wilsden, May 16th, 1918.



Bronze-Age Weapons in the Doncaster Museum.

BRONZE-AGE WEAPONS IN THE DONCASTER MUSEUM.

(With Plates IV.-VI.)

T. SHEPPARD, M.Sc., F.G.S.

The Museum at Doncaster contains twenty weapons of the Bronze Age, most of which were purchased many years ago by the Doncaster Corporation, in order to keep in the district the collection of antiquities formed by the late Cotterill Clark, and this formed an excellent beginning for the town's Museum which was subsequently formed. Through the kindness of the Doncaster Corporation, and Dr. Corbett, who has charge of the collections during the Curator's absence in the army, I am able to illustrate and describe this small but representative series. The specimens include a rapier-shaped blade, 6 spears, one flat axe, 8 palstaves, 3 socketed axes, and a chisel. It is worthy of note that with the exception of Dane's Hill, a place of doubtful localization, the implements are nearly all from the eastern side of Doncaster, *e.g.*, Hatfield, Bawtry, Scrooby, Finningley, Misson, Rossington, Tickhill. Possibly this is due to the former prevalence of fen bogs on this side, where such objects would be more likely to get lost.

Fig. 1.—Is a broad rapier-like blade, in excellent condition, to the base of which two massive bronze rivets are still attached. It is 14 ins. in length, 3 ins. across at the widest part, and 2 ins. at the base. It is decorated at each side by a sloping ridge, $\frac{2}{5}$ in. from the edge, and from the junction of these, at a distance of $\frac{1}{8}$ in. from the point, a medial ridge commences and remains sharply defined for 4 inches, and then gradually disappears into a curved ridge. The two rivets are cylindrical, $\frac{3}{4}$ ins. in length and $\frac{1}{4}$ in. in diameter. The specimen is similar in shape to Fig. 311 in Evans's 'Ancient Bronze Implements of Great Britain,' but is shaped at the base more after the pattern of his No. 313. It was dug up between Misson and Finningley in 1826. Weight, 13 oz.

No. 2 is a typical Irish flat axe, the cutting edge of which has been roughly used, and the opposite end is slightly flattened and protrudes over the sides of the axe, through having been hammered when used as a wedge. It measures $5\frac{1}{4}$ ins. in length, is $1\frac{5}{8}$ ins. at the top, $3\frac{1}{2}$ ins. at the widest part, the cutting edge being 4 ins. in length. The axe is of unequal thickness, measuring $\frac{1}{2}$ in. on one side, and only $\frac{1}{4}$ in. on the other. In type it is somewhat similar to Evans's No. 19, from Drumlanrig, and from its primitive form and resemblance to the early stone celts it is evidently a very early type of Bronze-Age weapon. There are a number of marks on the face of the axe, which seem to be the result of blows with some sharp instrument, and are not for decoration. It was found at Killarney in 1838. Weight 1 lb., 3 oz.

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Fig 3 is a short winged celt, and is as originally cast, the cutting edge not having been hammered out; otherwise it would have somewhat resembled Evans's No. 53 from Burwell Fen. It is 4 ins. in length, 1½ ins. across the cutting edge, 1 in. across the wings, the depression on each side for the shaft extending for 1¾ ins. At the base of this depression on both sides of the axe is a semi-lunar decoration. Weight 7¼ oz.

Fig. 4.—A winged celt, 5½ ins. in length, 2 ins. in greatest width, the cutting edge being 2½ ins. long, and the wings 1 in. in width; the depression for the shaft 2 ins. in length, below which, on each side, is a large semi-lunar decoration, containing three raised ridges, very much after the pattern of the ridges which frequently occur on socketed axes. In this case the bronze was hardly sufficiently molten when put into the mould, resulting in the surface being considerably wrinkled. It is from Ashby, Lincs. Weight 9¾ oz.

No. 5.—An axe of somewhat similar type to the preceding which has suffered by the use of a file. There is a broad medial ridge along the blade, and a narrow raised ridge, to assist in secure shafting, in the hollows for the handle. This axe resembles Evans's No. 63, from Sunningwell. It is 5¼ ins. long, 2 ins. wide, length of cutting edge 2¼ ins., wings ⅞ in. across, but were originally slightly more. The hollows for the shaft extend for 1¾ ins. It is from Scrooby, Notts. Weight 9½ oz.

No. 6.—A plain winged celt with cutting edge well formed and sharpened; length 6½ ins., greatest width 2¼ ins., cutting edge 3 ins., width of wings 1 in., hollows for shaft 2¾ ins., though these are more shallow than usual. Found at Tickhill. Weight 14½ oz.

No. 7.—A palstave provided wth a loop for secure shafting, decorated by a prominent medial ridge, as well as by a smaller ridge on each side of the blade, these three gradually disappearing towards the cutting edge. The top of the axe has been hammered flat. Length 6¼ ins., width 2½ ins., wings 1 in. wide. This specimen was found on the bank of the River Idle at Misson, Notts., in 1864. Weight 12½ oz. A very similar example to this is in the Hull Museum.

No. 8.—A long-bladed, narrow, but massive palstave, provided with a loop, its characteristic being its small cutting edge compared with its length, and the wings triangular in shape. A broad ridge occurs on each side of the blade, which disappears towards the cutting edge. Length, 6⅛ ins., greatest width 1¾ ins., cutting edge 2 ins.; width of wings at base, 1⅛ ins., length of hollows for shaft 2¾ ins. It bears a label to the effect that it was found at Dane's Hill near Adwick-le-Street. Weight 16½ oz.

No. 9.—An axe similar in type to the last, but more massive, and better formed. It is almost as turned out from the mould,

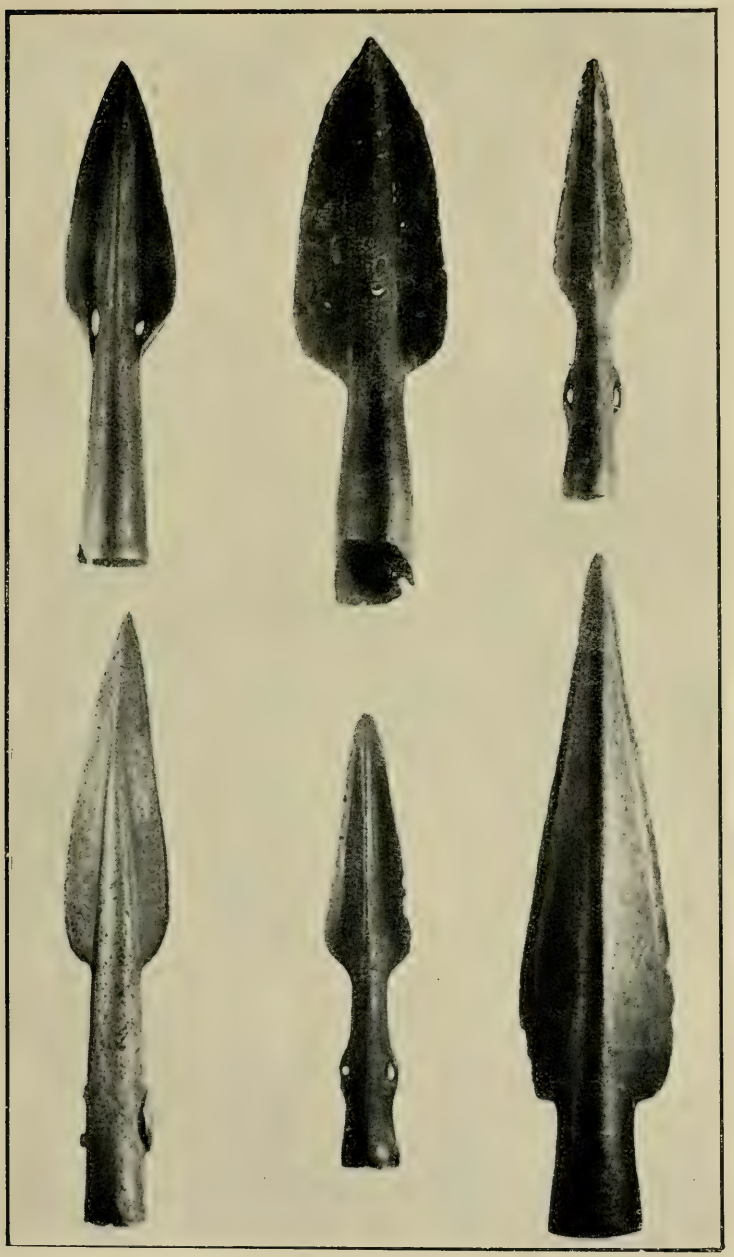
9 7 12

14

8 10 11 13

Bronze-Age Weapons in the Doncaster Museum.

17 16 19



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Bronze-Age Weapons in the Doncaster Museum.

the cutting edge being only slightly hammered out. The blade is decorated with a roof-like ridge which gradually disappears abot 1¼ ins. from the cutting edge. Measurements : Length, 7⅛ ins., greatest width, 2⅛ ins., cutting edge 2⅜ ins., width of wings at base, 1 in., length of hollows for shaft 3 ins. Weight 1 lb. 5 ozs. Found in Catherine Street, Doncaster, with No. 11.

No. 10 is an implement of somewhat uncommon pattern, of the type classified by Evans as ' palstaves with transverse edge.' Of these Evans says : ' Palstaves of the Adze form, or having the blade at right angles to the septum between the flanges, are but very seldom found in Britain.' He figures one from Cumberland and one from Lincolnshire, and mentions other examples found in other countries. The specimen figured herewith, however, is different from any of those engraved by Evans, though more resembles the Lincolnshire example. The centre of the instrument is square in section, the sides and eges are flat, the hollow for the handle being intensified by the edges standing out from the rest of the implement. The cutting edge is hammered out more than in the case of those figured by Evans. Length of specimen 4⅞ in. width and thickness ½ in., greatest width ⅞ in., cutting edge when complete 1 in., hollows for the shaft extend for 1⅞ in. The specimen was found at Sandtoft in 1816. Weight 4 ozs.

No. 11 is a chisel, provided with a tang for driving into a wooden handle. It is more slender in form than the chisel of a similar type figured by Evans. The blade is somewhat triangular in shape, and there is a broad collar to keep the handle in position. Measurements : length 4⅗ ins., width at cutting edge 1 in., thickness averages $\frac{5}{10}$ in.. length of tang (which is square in section) 1½ ins., diameter of top, which is circular, ¾ in. Found in Doncaster with No. 10. Weight 1¾ ozs.

We now come to the socketed axes, which are later in type :

No. 12 is quite a typical example similar to those in the hoard recently found at Scarborough (see *The Naturalist*, May, 1917). It is devoid of ornamentation, except for a slight collar, and the merest suspicion of a ridge on each side of the blade. The hollow for the shaft is almost circular and quite plain ; the cutting edge is slightly damaged, and a piece is broken out from one side of the collar. Length, 3½ ins., width 1¾ in., measurement across the socket, which is only slightly squared, 1½ ins. The collar is a little more than ½ in. from the top. The marks formed on the sides from the two valves of the mould are prominent, and the cutting edge does not seem to have been hammered out very much. Found at Finningley. Weight, 6½ ozs.

No. 13 is also very plain, the only decoration being the merest suspicion of a collar about ¼ in. from the top. It is

somewhat similar to the type figured by Evans (No. 151) from Newham, Northumberland. Length 3¾ ins., width 2 ins., cutting edge 2⅜ in. measurement around socket, which is almost circular 1⅜ ins ; the hollow for the handle being perfectly plain. This specimen was found at Hatfield Woodhouse. Weight 5 ozs.

No. 14.—A fine wedge-shaped inplement, much after the type of Evans's No. 150, from Wallingford, Berkshire, though the specimen here figured is more elaborately decorated. The sides of the blade are ornamented by prominent ridges, the second ridge occuring between the flat part of the axe and the two edges of the mould, which are formed into still another ridge. In this way there are five ridges on each side of the axe, extending to within 1½ ins. of the cutting edge, which is almost straight, due to repeated sharpening. There is a well defined collar at a distance of ⅜ ins. from the top, from which the ridges start. Length 4⅜ ins., greatest width 2⅜ ins., cutting edge 2½ ins., width across the top, which is only roughly squared, 1⅜ ins., the hollow for the shaft being plain. The specimen was found at Scrooby, Notts. Weight 7 ozs.

The Doncaster collection contains half-a-dozen spears, interesting types being represented.

The first, No. 15, is a massive plain implement, with short shaft, the outside of which extends towards the point of the implement in the form of a rounded ridge. The edges are sharpened in the same way as the rapier-blade already described (No. 1). The socket extends to a distance of 5¾ ins. within the spear, and on each side is a small circular hole for a rivet, at a distance of ¾ ins. from the bottom. Length 8 ins., greatest width, 1⅞ ins., length of shaft 1½ ins., greatest width of ditto 1⅛ ins. It was found between Finningley and Blaxton in A.D. 1826. Weight 6 ozs.

No. 16 is a somewhat rare type for Yorkshire, the sides of the spear being unusually broad for their length. The shaft is fairly long, and like other portions of the implement, slightly damaged, and there are two circular holes for rivets 1 in. from the bottom. Length 7 ins., length of blade 4¼ ins., greatest width 1⅞ ins., width across shaft when complete 1 in. The socket extends for slightly over 4 ins. along the blade. It was found at Finningley. Weight 4¼ ozs.

No. 17.—A spear with two holes at the base of the blade, evidently to assist in the shafting, being somewhat similar in type to Evans's No. 410 from Lincolnshire. There are no holes for rivets as in the spear heads already described, and the shaft is continued towards the point. Length 6⅛ ins., greatest width 1⅜ ins., width across the socket ⅞ in., length of the socket 4 ins. This specimen was found at Hatfield. Weigh 5 ozs.

No. 18.—A well made spear head with lozenge-shaped loops at the sides, $\frac{3}{4}$ ins. in length, to assist in the shafting, and at a distance of $1\frac{7}{8}$ ins. from the bottom, though one of these is broken. It somewhat resembles Evans's No. 394 from Thetford, Suffolk, but the example figured herewith us almost devoid of ornamentation, though there are just traces of two slight grooves running round the edge of the blade, and two clearly marked narrow grooves round the edge of the socket. Measurements : Length $7\frac{3}{8}$ ins., greatest width $1\frac{3}{8}$ ins., length of shaft, 3 ins. The socket extends into the spear for at least $5\frac{1}{2}$ ins. This specimen was found at Bawtry. Weight 4 ozs.

No. 19.—A well made spear head with side loops of somewhat primitive pattern, at a distance of $\frac{3}{4}$ in. from the bottom. The blade is slightly decorated by a ridge on each side of the medial ridge, and marks of the mould are clearly shown. Measurements : Length, $5\frac{3}{8}$ ins., greatest width of blade, $1\frac{1}{8}$ ins., length of shaft $2\frac{1}{4}$ ins., length of socket 3 ins., width across neck, which is damaged, $\frac{3}{4}$ in. This was found at Rossington in 1842. Weight 2 oz.

No. 20 is a well patinated example, which has a slight flaw on one side of the blade. There are well-formed loops at a distance of 1 in. from the bottom, and a slight hollow around the base of the socket, which still shows the original file markings made in sharpening. Length, $5\frac{1}{4}$ in., greatest width, 1 in., length of shaft $2\frac{1}{4}$ ins., length of socket $3\frac{3}{4}$ ins., possibly more. This was found at Doncaster. Weight 2 ozs. The specimen is similar to that from Hutton Cranswick (fig. 26) in *The Naturalist* for May, 1897.

In reference to these last-named implements, a valuable paper on 'The Origin, Evolution, and Classification of the Bronze Spear-head in Great Britain and Ireland,' by W. Greenwell and W. P. Brewis, appears in *Archaeologia*, Vol. LXI., pt. 2, 1909, pp. 439-472. In this it is pointed out (p. 458) that 'the leaf-shaped socketed form, if we may judge from the relative number of the type which have been discovered, appears to have been in use during a longer time than any other. It is, moreover, essentially the type which almost exclusively prevailed in all other countries where a bronze spear-head existed. It was not, however, in those countries the product of an evolution through other forms, but seems to have made its appearance there when in a perfected state. This fact, which cannot be controverted, may perhaps claim for Great Britain and Ireland that not only did the socketed head originate there independently, but further, that from thence it passed into those countries of Europe and elsewhere where it has been found.'

WESTMORLAND COLEOPTERA.

F. H. DAY, F.E.S.

(*Continued from page 191*).

Olisthopus rotundatus Pk. Tebay (Bowman).
Agonum assimile Pk. (*junceus* Scop.). Melkinthorpe, Gt. Strickland (Britten).
A. müllleri Hbst. (*parumpunctatus* F.). Tebay (Bowman), Melkinthorpe, Cliburn (Britten).
A gracile Gyll. Tebay (Bowman).
A. fuliginosum Pz. Kirkby Stephen (Thompson), Melkinthorpe (Britten).
Dromius linearis Ol. Tebay (Bowman), Melkinthorpe (Britten).
D. quadrinotatus Pz. Tebay (Bowman), Melkinthorpe (Britten).
D. meridionalis Dj. Melkinthorpe (Britten).
D. 4- maculatus L. Melkinthorpe, Cliburn (Britten).
D. melanocephalus Dj. Melkinthorpe, Great Strickland, Cliburn (Britten).

Hydradephaga.

Brychius glabratus Villa. (*elevatus* Pz.). Tebay (Bowman).
Haliplus obliquus F. Tebay (Bowman).
H. fulvus F. Tebay (Bowman).
H. ruficollis De G. Shap (Day), Melkinthorpe, Cliburn Moss (Britten).
H. lineatocollis Marsh. Tebay (Bowman), Melkinthorpe, Cliburn Moss (Britten).
Hydroporus 12-pustulatus F. Melkinthorpe (Britten).
H. elegans Sturm. (*depressus* F.). Tebay (Bowman), Melkinthorpe (Britten).
H. borealis Gyll. (*davisi* Curt.). Tebay (Bowman).
H. sanmarki var. *rivalis* Gyll. Tebay (Bowman), Melkinthorpe (Britten).
H. erythrocephalus L. Tebay (Bowman), Kirkby Stephen (Thompson), Melkinthorpe, Cliburn Moss (Britten).
H. palustris L. Tebay (Bowman), Kirkby Stephen (Thompson), Melkinthorpe, Cliburn Moss, Great Strickland (Britten), Shap (Day).
H. tristis Pk. Rydal (Black).
H. piceus Steph. (*gyllenhali* Schiöd.) Rydal (Black), Kirkby Stephen (Thompson).
H. melanocephalus Gyll. (*morio*, Brit. Cat.). Rydal (Black), Kirkby Stephen (Thompson).
H. obscurus Sturm. Rydal (Black), Kirkby Stephen (Thompson).

Hydrophorus planus F. Melkinthorpe, Cliburn Moss (Britten).
H. pubescens Gyll. Tebay (Bowman), Rydal (Black) Cliburn Moss, Melkinthorpe (Britten), Shap, Witherslack (Day).
H. discretus Fair. Tebay (Bowman), Melkinthorpe (Britten), Kirkby Stephen (Thompson).
H. nigrita F. Kirkby Stephen (Thompson), Melkinthorpe (Britten).
H. memnonius Nic. Tebay (Bowman), Cliburn Moss (Britten).
Agabus guttatus Pk. Kirkby Stephen (Thompson), Melkinthorpe (Britten).
A. bipustulatus L. Tebay (Bowman), Rydal (Black), Kirkby Stephen (Thompson), Melkinthorpe, Cliburn Moss (Britten), Shap (Day).
A. paludosus F. Tebay (Bowman).
A. chalconotus Pz. Melkinthorpe, Cliburn Moss (Britten).
A. congener Pk. Patterdale (Britten).
A. nebulosus Forst. Tebay (Bowman).
A. sturmi Gyll. Cliburn Moss, Melkinthorpe, Patterdale (Britten).
Platambus maculatus L. Tebay (Bowman), Melkinthorpe (Britten).
var. *immaculatus* Donis. Patterdale, in Ulleswater (Britten).
Ilybius fuliginosus F. Tebay (Bowman), Cliburn Moss (Britten).
Rhantus exoletus Forst. Cliburn Moss (Britten).
Colymbetes fuscus L. Cliburn Moss, Melkinthorpe, Patterdale (Britten).
Acilius sulcatus L. Cliburn Moss, Patterdale (Britten).
Dytiscus marginalis L. Patterdale (Britten).
D. punctulatus F. Cliburn Moss (Britten).
Gyrinus natator Scop. Tebay (Bowman), Melkinthorpe, Cliburn Moss (Britten).

PALPICORNIA

Helophorus aquaticus L. Tebay (Bowman), Melkinthorpe, Cliburn Moss (Britten), Witherslack (Day).
H. æqualis Th. Tebay (Bowman), Melkinthorpe (Britten).
H. brevipalpis Bed. Tebay (Bowman), Melkinthorpe, Cliburn Moss, Patterdale (Britten), Lowther Park (Day).
H. ytenensis Shp. Witherslack (Day).
H. viridicollis Steph. (*æneipennis* Th.). Tebay (Bowman), Melkinthorpe, Cliburn Moss, Patterdale, Appleby (Britten), Shap, Witherslack (Day).
Ochthebius exsculptus Germ. Tebay (Bowman).
Hydræna gracilis Germ. Tebay (Bowman).
H. riparia Kug. Melkinthorpe, Cliburn Moss (Britten).

Hydrobius fuscipes L. Melkinthorpe, Cliburn Moss (Britten), Witherslack (Day).

var. *subrotundatus* Steph. (*picicrus* Th.). Tebay (Bowman), Melkinthorpe (Britten), Shap (Day).

Anacæna globulus Pk. Tebay (Bowman), Melkinthorpe, Cliburn Moss (Britten), Shap (Day).

A. ovata Reiche. Shap (Day), Melkinthorpe (Britten).

Philydrus fuscipennis Th. Shap (Day).

Laccobius minutus L. Melkinthorpe (Britten).

L. alutaceus Th. Melkinthorpe (Britten).

L. nigriceps Th. Shap (Day).

Limnebius truncatellus Thunb. Tebay (Bowman), Melkinthorpe, Patterdale (Britten), Shap (Day).

Coelostoma (*Cyclonotum*) *orbiculare* F. Tebay (Bowman).

Sphæridium scarabæoides L. Tebay (Bowman), Melkinthorpe, Great Strickland, Patterdale (Britten), Pendragon Castle (Day).

S. bipustulatum F. Tebay (Bowman), Melkinthorpe, Cliburn, Lowther (Britten).

Cercyon impressus Sturm. (*hæmorrhoidalis* Hbst.). Tebay (Bowman), Melkinthorpe (Britten).

C. ustulatus Preys. (*hæmorrhous* Gyll.). Cliburn Moss (Britten).

C. hæmorrhoidalis F. (*flavipes* F.). Tebay (Bowman), Melkinthorpe (Britten), Witherslack (Day).

C. melanocephalus L. Tebay (Bowman), Melkinthorpe (Britten), Kirkby Stephen (Thompson), Witherslack, Pendragon Castle (Day).

C. lateralis Marsh. Tebay (Bowman), Melkinthorpe (Britten), Witherslack (Day).

C. unipunctatus L. Tebay (Bowman), Melkinthorpe, Lowther (Britten).

C. quisquilius L. Tebay (Bowman), Melkinthorpe (Britten).

C. analis Pk. Melkinthorpe (Britten).

C. pygmæus Ill. Tebay (Bowman), Melkinthorpe, Cliburn Moss (Britten), Wild Boar Fell (Day).

Megasternum boletophagum Marsh. Tebay (Bowman), Kirkby Stephen (Thompson), Melkinthorpe, Great Strickland, Lowther (Britten).

Cryptopleurum atomarium Ol. Cliburn, Melkinthorpe (Britten).

(To be continued).

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All alien enemy members have been removed from membership of the British Ornithological Union.

Dr. T. F. Sibly, Professor of Geology at Cardiff, has been appointed Professor of Geology at Armstrong College, Newcastle, in succession to the late Prof. Lebour.

YORKSHIRE NATURALISTS AT BARNARD CASTLE.

MAGNIFICENT weather favoured the gathering of the Union at the old-world town of Barnard Castle during the Whitsuntide recess, and, although the party was not a large one, the increased cost of travelling and restricted service of trains doubtless accounting for this, those who found themselves at liberty to attend the excursion had ample recompense. Military duties prevented the attendance of the President. Several members of the Darlington and Teesdale Naturalists' Field Club attended the excursions.

Headquarters were at the King's Head Hotel, which is reputed to be the hostel where Dickens stayed while working up his famous book, 'Nicholas Nickleby.'

Immediately behind the hotel are the remains of the twelfth century castle founded by Bernard Baliol. The most conspicuous feature is the Keep, or Baliol's Tower, which is in a good state of preservation; a great portion of the grounds are under cultivation. Opportunity was taken to inspect the Norman doorway of the Parish Church, which doorway shows toothed ornamentation. An interesting time was also spent in an inspection of a portion of the contents of the Bowes Museum, an ornate and imposing building in the French Renaissance style. Housed in the museum are valuable oil paintings, in which the English, French, Spanish and Italian schools are well represented. There is also a magnificent collection of china, porcelain, glassware, ivories, crystals, brass-work, and old coins.

On Saturday, the party was under the guidance of Mr. J. P. Robson. Taking the path along the south side of the river an inspection was made of the remains of Egglestone Abbey, a picturesquely situate ruin, which dates from the early part of the thirteenth century, being then inhabited by monks of the Premonstratentian order. The views from the Abbey Bridge, with its battlemented parapets, were delightful, as was the walk along the riverside to the meeting of Greta with Tees. The charms of Rokeby Park were likewise enjoyed, the arboreal features being especially satisfying. The day's excursion was brought to a close with a walk along Brignall Banks, where the beauty of the woodland and wealth of wild flowers recalled the verse of Sir Walter Scott's poem:

'Oh, Brignall banks are fresh and fair
And Greta woods are green;
And maid may gather garlands there
Would grace a summer queen.'

The site of the Roman Camp was inspected, the outline of which was well defined, especially the vallum and double ditch on the north side The remains of old Brignall Church mark a peaceful spot, and it was noted that the oldest tombstone dated back to the year 1693.

On the following day opportunity was taken to revisit a portion of Upper Teesdale, Mr. F. S. Hare acting as guide. From Middleton-in-Teesdale the party drove to Langdon Beck, crossed the rough pastures in the vicinity of Cronkley Scars, and there saw to perfection the exquisite beauty of Blue Gentian (*Gentiana verna*). The walk was continued along the beck to its junction with the Tees, the scramble amongst the huge boulders and rocks which intersect a portion of the path calling for care and agility; thence through the Juniper scrub to High Force, where the scenic charms were greatly appreciated.

The whole of Monday was spent in an investigation of Deepdale, a beautiful wooded valley, through which runs the Deepdale beck, the waters of which at the head of the valley fall in picturesque fashion over the rocks. Mr. Bailey acted as guide.

The usual meeting was held at the close of the excursion in the Castle grounds, Mr. W. N. Cheesman, J.P., F.L.S., presiding. Three gentleman and the Whitby Literary and Philosophical Society were elected to the membership of the Union. Sectional reports were given, concluding

with a vote of thanks to the landowners and the guides, and to the divisional Secretary, Mr. J. Hartshorn, for his valuable services in connection with the local arrangements. W.E.L.W.

CONCHOLOGY.—Mr. J. W. Taylor, M.Sc., writes:—The collections made by Mr. Greevz Fysher have been sent to me for determination. From Deepdale he has sent *Helix hortensis* var. *lutea* (12345), immature; *Helicigonum arbustorum, Hyalinia alliaria, Arion subfuscus* var. *nigricans* Pollonera, *Agriolimax agrestis, Succinea pfeifferi* Bourg., *Zua lubrica, Limnæa peregra* and var. *acuta* Gray, and *Ancylus fluviatilis*. From Rokeby there is *Helix hortensis* var. *lutea* 00000, 12345; *Hygromia hispida, Hyalinia nitidula, Pyramidula rotundata, Clausilia laminata* and *Agriolimax agrestis*.

In county Durham, from Barnard Castle gardens, are *Helix aspersa, Helix hortensis* var. *lutea* 12345, *Hygromia hispida* and *Hyalinia cellaria*. From Langdon Beck, *Helix nemoralis* var. *carnea* 12345, and from Romaldkirk, *Helix hortensis* var. *lutea* 00000, 12345, *Helicigonum arbustorum* and vars. *trochoidalis* and *marmorata*; a total result of 15 species and six varieties.

COLEOPTERA.—Mr. M. L. Thompson, F.E.S., writes that more than 60 species of beetles were met with along the route through Deepdale, and by the roadside on the return journey from Bowes to Barnard Castle. Of these, *Quedius attenuatus* Gyll., *Lathrobium boreale* Hoch., *Trogophlæus elongatulus* Er., *Eusphalerum primulæ* Steph., *Anthobium sorbi* Gyll., *Melanophthalma fuscula* Hum., *Athous vittatus* F., *Phytodecta pallida* L., *Magdalis armigera* Fauv., *Hylastes ater* Payk. may be recorded for this division of the county. The fine sunny day was favourable to insect life, but the recent prolonged cold weather had considerably delayed the appearance of many coleoptera usually to be seen at this time of the year in this district.

LEPIDOPTERA.—Mr. Wattam had the opportunity of inspecting a portion of the very fine collection of Lepidoptera collected and bred by Mr. J. P. Robson, of Barnard Castle. The collection is rich in local forms, of which latter may be noted *A. atropos* (one specimen), *S. populi, C. plantaginis* (a fine series), *A. fuliginosa* (of the true ruby type), *B. quercus* and var. *callunæ, P. cassinea, D. cæruleocephala, T. batis, A. menyanthidis, L. pallens, L. impura, N. fulva, H. micacea* (good variation), two specimens of *X. polyodon* with black forewings, *X. hepatica, X. lithoxylea, P. cytherea, N. depuncta, N. c-nigrum*, some good woodland and moorland forms of *N. festiva, T. gothica, T. instabilis* and *T. stabilis*, a very fine series showing much variation, *X. gilvago, D. cucubali, P. chi* and var. *olivacea, D. templi, E. viminalis, A. aprilina* (beautiful specimens, many with melanic underwings), *H. glauca, H. protea* (showing nice variation), *A. myrtilli* (a fine series) and *G. libatrix*. Mr. Robson states that he took, near the Greta, a specimen of the rare *Anesychia funerella*.

DIPTERA.—Messrs. C. A Cheetham and W. H. Burrell write:—On the homeward journey, on Stake Fell we were interested to see a small black fly, *Hemerodromia melanocephala* Hal., very busy on the flowers of *Rubus Chamæmorus* L., the number and lack of other insects pointing to this species being here responsible for the polination of the *Rubus* which is a diœcious plant. The fly has been verified by Mr. A. R. Sanderson.

HYMENOPTERA.—In the fields on the sunny banks beyond Egglestone Abbey the bees *Andrena fulva* Schr. and *A. albicans* were busy, and also the parasitic or cuckoo bee, probably *Nomada ruficornis* L. The bees were kindly verified by Mr. Rosse Butterfield.

BOTANY.—Mr. Wattam writes:—The charms of the walk along the gorge-like valley of the Tees, to the meeting of the waters with those of the Greta, and then along the valley through which runs the latter river, as far as the ruins of Brignall Old Church, cannot be adequately described, so exquisite was the intermingled wealth of the ground carpet of blossom, and the leafage of the trees, especially that of the Lime, Beech, Horse

Chestnut and Mountain Ash, of which there were numerous fine examples. *Helleborus viridis* in fruit, *Geum intermedium*, *Adoxa Moschatellina*, *Chrysosplenium alternifolium*, *Primula elatior* and *Cystopteris fragilis* were noted.

The first thing to attract, at the entrance to Deepdale valley, was a typical Alder-Willow swamp, developed on the alluvial flat with its association of *Ranunculus Ficaria*, *Caltha palustris*, *Nasturtium officinale*, *Cardamine hirsuta*, *C. pratensis*, *C. amara*, *Lychnis Flosculi*, *Stellaria nemorum* (in great abundance), *Spiræa Ulmaria*, *Geum rivale*, *Galium Aparine*, *G. Witheringii*, *Angelica sylvestris*, *Petasites vulgaris*, *Veronica Beccabunga*, *Iris Pseudo-acorus*, *Poa trivialis*, *Equisetum limosum* and *E. palustre*.

The aroboreal features of the dale are most marked, the dominance of certain types differing throughout. At the commencement the prevailing trees are Sessile-fruited Oak, Sycamore, Mountain Elm and Beech; many excellent examples of the latter. This phase continues until merged into an almost pure zone of Spruce Fir. Then follows an Oak-Birch-Sycamore association, with Mountain Elm, Bird Cherry, Goat Willow and Beech intermingled, continuing as far as the railway viaduct. For the next three hundred yards to the right of the river, Birch zones are common throughout. The dominancy however lies with Oak and Mountain Elm, with sundry Ash, Goat Willow, Hazel, Elder, Blackthorn and Mountain Ash, Scot's Pine and Spruce. The cliffs on the left are crowned with a broad band of Spruce, Scot's Pine and Larch, with Hazel, Birch and Goat Willow on the ledges and slopes. Between the lower and upper falls, the conifers before mentioned, with Birch, are the dominant species on the left side, and on the right, Oak, Sycamore, Mountain Elm and Ash are the most noticeable, with Black Poplar, Bird Cherry, Hawthorn Hazel, Alder and Geulder Rose. To the left of the lower fall a great area has been cut down and is awaiting clearance.

The most interesting plants noted were *Geranium sylvaticum* just coming into bloom, *Hypericum dubium*, *Veronica montana*, *V. serpyllifolia*, *Asperula odorata*, *Ranunculus auricomus*, *Geum intermedium*, *Paris quadrifolia* and *Melica uniflora*. *Lathræa squamaria* was found growing on the roots of Hazel, Mountain Elm, Hawthorn and Black Poplar. *Epilobium angustifolium* is well established on the site of the old workshops. Seedlings of *Ranunculus Ficaria* were noted in great abundance, as well as the axillary tubers. Fine specimens of *Polystichum aculeatum* were found between the viaduct and the lower fall, and above the upper fall two stunted specimens of *Juniperus communis*.

Among the ruins of the old Castle *Cheiranthus Cheiri* is abundant, and *Linaria Cymbalaria*, *Antirrhinum majus* and *Parietaria officinalis* also occur.

Mycology.—Mr. W. N. Cheesman writes:—The number of fungi observed and collected was quite up to expectation considering the time of the year. The larger fungi were not numerous, the exceptions being the St. George's Mushroom, which was abundant at the side of a grassy lane near the 'Meeting of the Waters,' at Rokeby. These, together with gatherings of Morels brought in by Dr. Woodhead and Mr. R. Fowler Jones, amply supplied the proteins for the next morning's breakfast, and were much appreciated.

Armillarea mellea was responsible for the destruction of much coniferous and deciduous timber in Deepdale, the black rhizomorph mycelium between bark and wood bearing witness to the guilt of the accused. *Dasyscypha calycina* was also causing injury to the Larches at both Deepdale and Rokeby. Of the eighteen species of Mycetozoa gathered, about two-thirds were weathered specimens of last year's growth. The most notable species was *Diderma hemisphericum* springing from creamy white plasmodium.

G.B.=Greta Bridge; H.F.=High Force; D.=Deepdale

MYCETOZOA.

Badhamia utricularis Berk., D.
Physarum nutans Pers., G.B.D.
P. vernum Somm., G.B.
Diderma hemisphericum Hornm., G.B.
Craterium minutum Fries., D.
Didymium difforme Duby., G.B.
D. squamulosum Fries., G.B., D.
Comatricha nigra Sch., H.F.
Amaurochaete fuliginosa McB., D.
Lycogala epidendrum Fries., G.B., D.
Reticularia Lycoperdon Bull., G.B.
Trichia affinis De Bary, D.
T. persimilis Karst., H.F.
T. scabra Rost., G.B.
T. varia Pers., H.F., D.
T. decipiens McB., D.
T. Botrytis Pers., G.B.
Arcyria ferruginea Saut., H.F.
Perichaena corticalis Rost., G.B., D.

GASTROMYCETES.

Lycoperdon perlatum, D.
Bovista nigrescens, H.F.

AGARICACEÆ.

Armillaria mellea, H.F., GB.., D.
Tricholoma gambosum, G.B.
Collybia velutipes, D.
Mycena ammoniaca, H.F.
Omphalia umbellifera, H.F.
O. stellata, D.
Nolanea pascua, G.B.
Galera tenera, D.
Anellaria seperata, H.F.
Coprinus niveus, H.F.
Marasmius oreades, G.B.

POLYPORACEÆ.

Polyporus betulinus, D.
P. brumalis, D.
P. nidulans, D.
Polystictus versicolor, G.B., D.
Paria vaporaria, G.B., D.
Fomes ferruginosus, D.
Daedalea quercina, G.B.

THELEPHORACEÆ.

Stereum hirsutum, G.B., H.F., D.
Corticium calcium, D.
C. comedens, D.
Odontia farinacea, G.B.
Hymenochœte rubiginosa, D.
H. tabacina, D.
Grandinia granulosa, G.B.

TREMELLACEÆ.

Calocera cornea, G.B., D.
Tremella mesenterica, D.
Dacryomyces stillatus, H.F.

UREDINACEÆ.

(Determined by Mr. T. B. Roe.)
Uromyces ficariæ Lév., on pilewort, D.
U. alchemillæ Lév., on Lady's Mantle, G.B.
Puccinia saniculæ Grev., on Wood Sanicle, G.B.

PHYCOMYCETES.

(Determined by Mr. T. B. Roe.)
Synchytrium anemones Waron., on Wood Anemone, D.
Septaria anemones, on Wood Anemone, D.

DISCOMYCETES.

(Determined by Mr. Thos. Gibbs.)
Dasyscypha virginea, D.
D. nivea, G.B.
D. calycina, G.B., D.
D. clandestina, D.
Mollisia cinerea, H.F., D.
M. dilutella, G.B.
Helotium lutescens, D.
Morchella esculenta, G.B.

MOSSES AND HEPATICS.—Mr. C. A. Cheetham and Mr. W. H. Burrell write:—The bryology of the Tees district has been too well worked in the past to allow many additions to the published lists, but a little moss on the walls near Egglestone Abbey, *Seligeria recurvata* B. and S. (*S. setacea* Lindb.), does not appear to be included.

A growth of *Ceratodon purpureus* Brid. was seen with the excurrent nerve of *C. conicus* Lindb., but not distinct enough to place under the latter species.

The next addition was on Widdybank, where *Thuidium Philiberti* Limpr. was gathered, it was the tripinnate form known as var. *pseudo-tamarisci*.

On the peat above, a patch of the very rare *Tetraplodon Wormskjoldii* Lindb. provided the bryological thrill of the excursion; it was in the best possible condition of fruit. This moss was first gathered in Britain in this locality by Mr. M. Slater in 1870, but considered to be a form of *T. mniodes* B. and S. (*T. bryoides* Lindb.); later, in 1901, Messrs. Horrell and Jones, whilst working at sphagna here, gathered and recognised it,

and on seeing their announcement, Mr. Slater looked his specimen up and found it to be the same species; since then it has been gathered in Scotland. The plant was growing on bare peat and no trace of bones could be found; with it was *Webera nutans* and *Cephalozia bicuspidata* Dum., the whole patch covering some 15″×10″. The books state it to be a monoicous species, but the distinct areas of male plants seemed to point to a dioicous state. A succession of male and female inflorescences on separate stems, having no apparent structural union, showed a segregation of sex of several years' duration, but careful examination of the material gave no clue to the origin of the male stems, whether from the leaf axils of a monoicous plant or from male producing spores.

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Rare Ducks in Upper Nidderdale.—On May 8th, a friend of mine picked up a male Ferruginous Duck (*Fuligula nyroca*) in Upper Nidderdale. It had been killed by flying against the telephone wires; and on May 9th near the same place a male Gadwall (*Anas streperera*) was captured. It had been shot at and its wing broken.—R. Fortune.

Fieldfares near Harrogate.—After practically a complete absence of these birds during the winter, a large flock consisting of at least 100 birds, put in an appearance in the fields between Ripley and Hampsthwaite. They were first seen on April 28th, and remained in the neighbourhood until May 3rd. An unusually late stay in this neighbourhood is worth recording; a friend of mine, a good observer, saw a flock of about thirty fieldfares on Masham Common on June 17th, 1916.—R. Fortune.

Pine Marten in Shropshire —I recently had shown to me the skull of a Marten that had been trapped near Wellington, Shropshire, about 27th May. It was a female and, judging by the worn state of the teeth, an old one. In *The Zoologist*, 1908, I wrote a paper on the Marten in England and Wales, summarizing all the known records up to that year, and showing that the only districts in which the species still exists in any numbers are the Lake District and the west of North and Central Wales. In spite of this fact the animal now and then turns up in places many miles distant from these districts —places in which it has been long extinct. In Shropshire it became extinct in 1862, yet in April-May, 1907, two females were taken in localities near the Welsh border a few miles apart, while in 1891 one was taken in Eaton Park, Chester. It is inconceivable that the animals were resident in these localities, or that they could have been there for any length of time without being noticed by keepers, etc. I attribute these occurrences to an innate propensity for roving in this species, and in my paper give many other instances in confirmation. This fresh occurrence at Wellington can only be accounted for on the same assumption, as it is a populous locality and most of the country preserved.—H. E. Forrest, Shrewsbury.

In Memoriam.

W. LOWER CARTER, M.A., F.G.S.

1855—1918.

We much regret to record another serious gap in the ranks of our prominent Yorkshire naturalists. On June 21st, the Rev. W. Lower Carter passed away at his residence at Watford, a few days after a seizure, which from the first was evidently serious. 'Lower Carter,' as he was usually known in the north, was a familiar figure at the meetings and excursions of the Yorkshire Scientific Societies, especially during the time he

was living at Mirfield. In the Yorkshire Naturalists' Union he held many positions on various geological committees and on the Council for many years, and his name was familiar to readers of *The Naturalist*. He was best known for his work in connexion with the Yorkshire Geological Society where for a considerable period he served in the capacity of Hon. Treasurer, Secretary, and Editor of the Society's Proceedings, which reached a leading place among provincial publications while under his charge, and which contained most important contributions to the geology of the county by some of our most prominent geologists. His services were especially valuable with regard to the business side of the work of Scientific Societies, and the excursions of the Yorkshire Geological Society which he arranged were triumphs of organisation. In more recent years he did good service as Recorder of Section C. (Geology) of the

British Association. Previously he took a keen interest in the work of the Leeds Geological Society.

When he left Yorkshire in order to take charge of a church in Birkenhead, Mrs. Carter and he were the recipients of valuable presents which had been subscribed for by his colleagues in the Yorkshire Geological Society, though he continued for several years to render good service to the society.

Lower Carter was not so well known for his original investigations in geology as he was for the able way in which he summarised and followed up the work of others. He was of considerable assistance in connexion with the work of recording the erratic blocks of the county, with regard to the investigations on underground waters, and he also followed the work of Prof. Kendall and others relating to old river courses, and wrote some papers on the old channels of the Don and district. He compiled a useful Classified Index of the first fourteen volumes of the Proceedings of the Yorkshire Geological Society (1839-1902), and for many years contributed useful summaries of the work of the Geological Section of the British Association, to *Nature* and *The Naturalist*. In 'The Bibliography of Yorkshire Geology' by the present writer, published by the Yorkshire Geological Society in 1915, Lower Carter is responsible for forty-one items, mostly short notes, between 1889 and 1914; these may be said to represent his contributions to geological literature.

For several years he was the minister at the Congregational Church at Mirfield; he then went to a more important church at Birkenhead, but after a short stay he went to London as a teacher of geology, and as such was at the East London College until he died.—T. S.

——: o :——

The collection of Reptilian Footprints in Triassic Rocks made by Mr. H. C. Beasley have found a permanent home in the Liverpool Museum.

We have received from Charles Janet, a paper on 'Le Volvox,' published at Limoges (149 pp.), which contains some remarkable diagrams; also a 'Note Préliminaire sur l'œuf du *Volvox globator*' (12 pp.), and a paper on 'Sur la Phylogénèse de l'orthobionte' (72 pp.), with six tables and eight plates; as well as other matter.

The University of Leeds has gratefully accepted a gift by Mr. W. Denison Roebuck of a collection of microscopic slides and a library of books upon the subject of Freshwater Algæ, as the nucleus of a specialist library and collection of algæ in general. These were the property of William Barwell Turner, who died twelve months ago, and who, since his coming to Leeds in 1877, had been one of the most active scientific workers in the city until laid aside by a serious illness. The value of the gift is enhanced by the fact that many of the books are illustrated by coloured drawings by Mr. Turner himself, he having been a talented natural history draughtsman. The collections will be known as the 'Barwell Turner Memorial,' and will be available for the use of students of algological science.

FIELD NOTES.

BIRDS.

Ring Plover Nesting in Nidderdale.—The Ring Plover has for the last few years nested in a certain place in Upper Nidderdale and has successfully reared young. They are again nesting this year, but only one pair. The female is sitting and the male spends his time with a party of Dunlin. The Dunlin, in full summer plumage, at the time of writing May 16th, have not yet departed for their breeding ground on an adjacent moor.—R. FORTUNE.

—:o:—

HEPATICS.

***Diplophyllum taxifolium* Wahlenb. in Westmorland.**—In July, 1900, Mr. Ll. J. Cocks sent me specimens of the above species, collected on Hart Crag, Westmorland, in August, 1898. In going through some old letters I find Mr. Cock's specimen and letter, which had never been answered. The specimen is correctly named and is an addition to Mr. Stabler's 'List of Westmorland Hepatics,' published in *The Naturalist*. Mr. Cocks writes:—'April 30th, 1918. I was amused to have a letter from you answering one which must have been written nearly twenty years ago, am very interested to know that you confirmed my specimen of *Diplophyllum taxifolium* from Westmorland (it is surely worthy of specific rank). Hart Crag, where I gathered it, is an eastern spur of Fairfield, looking down on Brothers' Water (height 2,698 ft.).' The specimen is deposited in the Manchester Museum.—W. H. PEARSON, A.L.S.

—:o:—

LEPIDOPTERA.

The Pairing of *Hepialus lupulinus*.—On June 2nd, at 9-10 p.m. (summer-time), I noticed a female *Hepialus lupulinus* resting on grass commence 'calling' by vibrating her wings. Presently a number of males 'assembled' to the place, flying about very quickly and in great excitement. Three minutes elapsed before one of the males found the female and copulated. This delay was evidently caused by the fitful way the female 'called.' The wing vibrations were only continued for a few moments at a time with short rests between. When the pair united I immediately boxed them, and placed the box a few yards away on the ground. None of the flying moths ever flew near the box, conclusively proving that the cause of the attraction had ended. However, the immediate space around where the female 'called,' that is a circle of about two yards across, was still the centre of much commotion. Five minutes after the pair was boxed at least twenty males were eagerly searching about for the female. Individuals were continually leaving, while others kept arriving, the numbers present at

any time now seemed to be diminishing, until twenty minutes after the boxing the attraction completely ceased, for males flew past the place in the swift jerky manner charactertistic of the species, but none lingered. Most of the moths undoubtedly came against the wind to the attraction, and it would seem that the vibrations travelled very slowly, and probably not very far before they were lost in space, for if they travelled far and over a wide area the assembled moths must have far exceeded the number present, for the males on that evening were flying in great abundance.—BEN MORLEY.

We do not believe that the vibrations of the wings of the female *H. lupulinus* have anything to do with attracting the males, beyond diffusing the scent, and possibly aiding the sight of the male, notwithstanding the 'fairy tales' about wireless telegraphy in moths which have recently appeared in one of our leading county newspapers. But, that some of the species in this genus do act very abnormally in their love making is certain, as it has been demonstrated beyond doubt that the female of *Hepialus humuli* seeks the male, and it is almost equally certain also that the female of *H. hectus* acts in the same way.—G.T.P.

***Eupithecia coronata* at Wakefield.**—On June 15th, in company with a few friends, a few hours were spent in Walton Hall Park near Wakefield. The most interesting 'find' was the capture of ten specimens of *Eupithecia coronata*, the pretty dull-green V. pug. Until recent years this species was a great rarity in our county. A few years ago Mr. L. S. Brady took it commonly near Sheffield, and four years ago a specimen was taken in Edlington Wood. The capture of the species at Walton Hall Park raises the important question of food plant, as every moth taken was found at rest on the trunks of chestnut, *Castanea vulgaris*. In the south of England the larvæ feed on the flowers of golden-rod, clematis, purple-loosestrife and hemp-agrimony, but at Walton none of these plants grow; the wood has an undergrowth of bracken and grass only, wild flowers seemingly excluded by the bracken. Under the park wall near by where the moths were found a few straggling brambles grow, but nowhere plentifully. Can it be that the larvæ fed on the flowers of these bushes? but why should the moths prefer to rest on chestnut trees growing amongst an abundance of oak and birch? Have the larvæ ever been found feeding on the leaves of any forest tree?—BEN MORLEY, Skelmanthorpe.

In the current number of the *Entomologist's Record* (June 1918, p. 109), Mr. W. Daws records *Eupithecia coronata* as swarming on sweet chestnut near Mansfield, and says the larvæ must feed on the flowers of that tree nothing else suitable occurring in that part of the wood.—G.T.P.

——: o :——

In the *Journ. Inst. Petroleum Technologists* for February Mr. W. H. Dalton writes on the 'Periodicity in Spouters'. He begins 'Mental indolence, and the impotence arising from ignorance combined with false pride, which endeavour to conceal both, too often lead men'; let us hasten to add however, that his note has no political significance, but relates to pumps and oilfields.

CORRESPONDENCE.

A MAGPIE FLOCK.

Referring to my remarks on p. 138, might I make it quite clear that when I used the word ' flock ' as applied to magpies, this word meant *only* cases where the birds were close together, and not birds which might be visible to an observer looking north, south, east and west, or wide apart ? Although never having to my knowledge spoken to Mr. Fortune, I was of the opinion he used the word in the same meaning. I never intended to suggest that every collection of magpies came together in order to mob a cat—such would have been absurd. When exploring the neighbourhood of that magnificent ruin, Rievaulx Abbey in Yorkshire, in 1903, I witnessed a pair of magpies chasing a wild rabbit as it ran, attacking it (so far as I could see) at the back of its head with their beaks. On seeing me, the birds fled, the rabbit escaping.

Fred D. Welch, M.R.C.S.

——o——

'DIMORPHIC COLORATION' IN THE CUCKOO.

What one appreciates (amongst other points) in Mr. Butterfield's ' Romance of the Cuckoo ' is the distinction drawn between ' fact ' and ' speculation ' (p. 130), in which he improves on some writers of mammals, birds, etc. As he refers to ' Dimorphism,' the following may be of interest, in two birds, both young, since his cases are presumably based on northern experience. During the summer of 1911, when staying at Rudgwick in Sussex, two young birds were caught on a fruit farm owned by Admiral Goodrich ; one by myself in a glass-house into which it wandered after insects (on a Monday), the other by a boy who was weeding, in some netting where it got entangled (the following Wednesday). These were of the same size, caught within thirty yards of each other in the same summer, and yet *quite different* in coloration, as proved by a long and thorough investigation when in my hands. One was of a darkish grey, the other a rich rufous red. What sex they were I cannot say, as I let both go free after noting their coloration, because they were very frightened after the long examination—cuckoos are useful birds.

When one comes across cases like the above, and notices Dimorphic Coloration in such mammals as apes, mungooses and wildcats, either within or near the tropical parts of Asia, Africa and South America, they confirm the words ' without such cause being in any way traceable to local influences ' (p. 130, l. 21). ' Dimorphic Coloration ' is of course different from seasonal change. A third young one (rather larger), found about 10 days before, gave a very peculiar exhibition of behaviour ; it, also, was rich rufous red.

There is one other point I should like to confirm, that being the remarks at bottom of p. 93 and top of p. 94. On May 14th of this year (1918), when watching a pair which frequent this locality, one was in a clump of forest-trees calling ' cuckoo ' as loud as it could, the other flew across a field behind my house (within about 70 yards of me) making the bubbling peculiar noise, and ' cuckoo,' one rapidly after the other, the two sounds being repeated alternately about fifteen times each. Fact is more valuable than opinion. I never found cuckoos so frequent in Kent and Sussex as in the west—in Herefordshire. Frederick D. Welch.

——o——

CUCKOOS' EGGS.

Referring to Mr. E. E. Pettitt's note on page 204 of *The Naturalist*, for June, I might in the first place state that cuckoos' eggs in this district, and perhaps this may apply to the Pennine Range generally, are, with very few exceptions, true to one type, which approaches that of the skylark more nearly than any other British bird. Indeed, the cuckoo occasionally lays its egg in the nest of this species, at least I have found it once in a nest which was built on a heathy waste.

From this type the cuckoo's egg here rarely deviates, but a considerable number of years ago I found the nest of a titlark on Marley Brow, near Bingley, which contained two cuckoos' eggs, both of which had evidently been laid by one cuckoo, since, though exactly alike, they were altogether different from any which I have ever seen in this district either before or since. Perhaps this may not be a usual occurrence. I have found several nests of the titlark containing two eggs of the cuckoo, but never could be certain they were both laid by one cuckoo.

In *The Naturalist* for 1898, page 224, Mr. Joseph Armitage records the finding of the nest of a Meadow Pipit containing three eggs of the dupe, and a fourth Pipit's egg lying a few inches from the nest, and also two eggs of the cuckoo, and further states that the *two cuckoo's eggs were of exactly the same size, shape and colour and possibly they were deposited in the nest of one bird.*

In *The Zoologist* for 1878, page 256,, Mr. Arthur Beale states that he once found the nest of a Hedge Sparrow which contained two cuckoo's eggs, '*both apparently laid by one bird, as neither was similar to any other cuckoo's egg I have ever taken*, but more resembled the Reed Wagtail's egg in colour.'

Mr. Pettitt gives the laying period of the cuckoo from the *end of May to the end of July*, which I take to be very late for any part of England. At any rate his remarks cannot apply to this district, since hereabouts most—I may say nearly all—cuckoo's eggs are laid not much earlier than the middle of May to the end of June. Very few cuckoo's eggs are laid here after July sets in.

E. P. Butterfield, Bank House, Wilsden.

—o—

STEETON ROOKERIES NEAR KEIGHLEY: REPORT ON EGG COLLECTING, APRIL 1918.

In March I received a circular from the West Riding County Council asking me to try to reduce the number of Rooks, as farmers complained of their doing much damage to crops. Shooting them was suggested, but it is no easy matter to shoot flying Rooks, and the result of a day's shoot on Easter Monday only produced three birds. Someone suggested taking the eggs before they were hatched out, so as a result of a careful two rounds of the nests we got 1,617 eggs or young ones from 359 nests. The young ones are from nests that were missed in the first round.

The task is quite easy for anyone exercising care and accustomed to working up ladders, and I was fortunate in interesting a firm of painters (Messrs. John Holmes & Sons, of Steeton) to do the work. There was no hitch or accident. Our trees are very tall and full grown—Beech, Sycamore, Ash and Elm—and the evenings selected for the work were fine and calm.

This is one of the largest Rookeries in England, and congregated in five places within a short distance.

Place.	*First collection begun Ap. 9th.*			*Second collection begun Ap. 19th.*		*Total.*
	Nests.	*Eggs.*	*Young.*	*Eggs.*	*Young.*	
Woodlands	45	111	—	124	19	254
Elmsley House ...	18	48	—	31	—	79
East Nurseries ...	106	176	—	221	47	787
West Nurseries ...	75	130	—	171	42	
Shroggs Wood ...	115	221	4	238	34	497
	359	686	4	785	142	1,617

1918 July 1.

One nest contained 6 eggs ; many nests contained 5 eggs ; a few were empty ; most nests had 5 eggs in the two collections. If each nest had contained 5 eggs, there would have been 1,795. A few nests, but not more than 30, were missed as they were very difficult to get at.

The eggs varied much in colour, shape and size.

In a few the young were hatched. These were mostly nests that had been missed during the first collection. One nest, 49 feet from the ground, contained a Common Fowl's egg, unbroken. Some people affirm it is an owl's egg, but it is bigger than an owl's egg—and Rooks have been seen to fly off with hen's eggs.

It is quite evident the birds did not lay a second lot of eggs in the same nest, because the total is not more than five to a nest, which is the usual number, and on May 5th we looked at several nests a third time, and found nothing in them. A few nests, not more than 24, were built later, but whether they were the same or late birds is difficult to say. Eggs were laid in the newly-made nests.

After the nests had been robbed, the birds flattened the nests down, but in a few cases a new nest was built on the top of the old one.

Another year I should recommend waiting until after they had finished laying, say the 15th of April, before taking any eggs, because it could be done at one collection, and I don't think any would lay a second time.

It is much easier taking eggs than young birds. It is not a pleasant job taking the young just hatched.

As a rule we did not average shooting more than 200 at our Annual Rook Shoot in May, so if every one of the 1,617 eggs had become a rook, and we only shot 200, what becomes of the other 1,400 ? It is obvious that very many die yearly either from disease, fighting or stress of weather.

Our Rookeries do not vary in numbers very much from year to year, as the following record shows :—1914, 363 nests ; 1915, 352 ; 1916, 355 ; 1917, 344 ; 1918, 359.

We hold a record for many years, and I find that the year 1832=208 nests ; 1842=186 ; 1852=344 ; 1862=193. No record was kept from 1864 to 1906.

It remains to be seen if the birds will desert the Rookery, and I hope they will not. Personally I don't think rooks do the amount of harm that farmers imagine ; but I believe they do a lot of good by killing slugs and other vermin. Jackdaws and Wood Pigeons do far more harm and are a real nusiance. But if they are to be reduced taking the eggs is the easiest way, and the least cruel ; if, however, young rooks are considered a good thing as food, it would be best to wait until about the first week in May, when the young could all be taken from the nests before thay can fly. If, say, 1,200 young could be got in this way, it is obvious there would be more food than the old way of shooting. But it would require a butcher, or some person accustomed to taking life ; I should not care for the job !

As regards damage to newly-planted corn, we tried the experiment of planting 1½ acres of oats and letting it take its chance ; then two weeks later we planted 7 acres more, and had it carefully watched, and as far as I can see the crop from the former is going to be as good as from the latter. It seems to me that if farmers plant corn it should be their duty to watch it for a few weeks until it has begun to grow, and not blame nature, and it could easily be done by a man or a boy going round a few times a day with a gun.

Anyone disposed to grumble at birds should read one of Longfellow's Tales of a Wayside Inn, called ' The Birds of Killingworth.'

SAMUEL CLOUGH, Steeton Hall, near Keighley, May 23rd, 1918.

——: o :——

Mr. Edward Sandeman has an interesting paper on ' The Derwent Valley Waterworks ' in the *Minutes of the Proceedings of the Institution of Civil Engineers.*

NEWS FROM THE MAGAZINES.

We regret to learn that the publication of *Wild Life* is suspended for the time being.

'The Convolvulus Hawk-moth in Ireland' is the title of a paper in *The Irish Naturalist* for June.

Mr. J. Davy Dean favours us with a copy of his paper on 'The Clausium in *Alopia*, a Sub-Genus of Clausilia,' reprinted from *The Journal of Conchology*.

The Entomologist for June contains an illustrated article on 'Contributions to our Knowledge of the British Braconidæ,' by G. T. Lyle, and 'Notes on the Spring Appearance of Some Insects in Yorkshire.'

Dugald Macintyre gives 'Some New Facts about Grit,' in *British Birds* for June. There are also notes on the Reappearance of Fieldfares; Black-necked Grebe in Westmorland, and Black Grouse in North Lincolnshire.

Prof. G. Elliott Smith has a paper on 'The Teaching of Anatomy' in *The Edinburgh Medical Journal* for March, 1918, in which he appeals for a revision of the old forms of teaching, and points out lines on which improvements might be made.

In *Man* for June, Prof. Boyd Dawkins draws attention to an illustrated article on Maltese Cart Ruts, in which certain deep furrows are described as having been made by vehicles during the Neolithic Age. Prof. Dawkins states that without doubt these grooves are not artificial, but caused by the weathering of the rocks, under perfectly natural conditions, and that they have no archæological significance.

The Journal of the Marine Biological Association for May contains 'The Food of Post-Larval Fish,' and 'Trematode Larva from *Buccinum undatum*, and Notes on Trematodes from Post-Larval Fish,' both by Marie V. Lebour; 'A Preliminary Account of the Production of Annual Rings in the Scales of Plaice and Flounders,' by D. Ward Cutler; 'A List of the Maritime, Sub-Maritime and Coast-frequenting Coleoptera of South Devon and South Cornwall, with especial reference to the Plymouth District,' by James H. Keys, as well as the report of the Council for 1917.

Science Progress for April, helps us with the usual summaries of recent Scientific research. Dr. J. W. Evans writes on 'The Fluviatile Theory of the Origin of the Old Red Sandstone,' and there is a remarkable illustrated paper by Major R. A. Marriott on 'The Downs and the Escarpments of the Weald: a New View of their Geological History,' in which he states that a better explanation than that usually adopted lies in the by no means improbable fact that this mountainous mass of chalk [over the Weald] had never any existence. This explanation has the merit of providing a simpler and perfectly intelligible stage-setting to begin with, while it affords a clear grasp of the probable changes throughout the history of the Weald.' The idea is not new, and we don't think Major Marriott will get many converts.

The Journal of the Northants Natural History Society and Field Club for 1917 is rather thinner than usual, as might be expected from the times we live in, extra cost of printing, etc.; nevertheless the four parts published contain many valuable papers bearing upon the natural history of the County, among which we notice 'Early Man in Northamptonshire,' 'The River System of Northamptonshire,' and reports on Meteorology and other subjects. The Magazine now has a new cover, upon which is a design showing a typical piece of Northamptonshire, 'embracing nearly all the sections of the Society's work—archæology, botany, entomology, geology, meteorology and ornithology; as well as illustrating sky, land and water; hill, valley and river; wood, field and lane; village, church and mansion; and industry by ricks, a smoking chimney and canal transport.'

NORTHERN NEWS.

The British Museum (Natural History) has issued a series of eleven leaflets dealing with various Food Economy Plants, etc.

Dr. David Forsyth, the president of the Yorkshire Geological Society, has retired from the headmastership of the Leeds Central High School, a position he has held for twenty-eight years.

The Report of the Norwich Castle Museum, recently issued, contains an excellent account of the work accomplished at that well-known Institution, notwithstanding the fact that the staff has been considerably depleted.

Part 15 of *Yorkshire Type Ammonites*, by S. S. Buckman, has recently appeared, price 3s. 6d., and contains figures and descriptions of *A. clevelandicus, A. elegans, A. ovatus, Bifericeras biferum, A. sedgwickii* and *Beaniceras senile*.

Our readers will regret to hear of the sudden death of the wife of Dr. H. H. Corbett, of Doncaster. Mrs. Corbett took a prominent part in the work of the Doncaster Scientific Society and did a considerable amount of good work in the town of her adoption.

Notwithstanding the difficult times, *The National Trust for Places of Historic Interest or Natural Beauty*, in its report recently issued, indicates that the Society is still capable of carrying on its excellent work, and during the year has made many valuable additions to this National collection.

Prof. George Hickling's paper on 'The Geology of Manchester as Revealed by Borings,' illustrated by a map, appears in *The Transactions of the Manchester Geological and Mining Society*, Vol. XXXV., Parts 7 and 8. The same publication contains a record of the presentation of two portraits of Prof. Boyd Dawkins, the 'father' of the Society, and of Mr. John Gerrard, who is an old and valuable member of the Yorkshire Naturalists' Union.

Mr. E. E. Lowe, Curator of the Museum and Art Gallery, Leicester, has been appointed Director of the Libraries there, in addition to his other work. Recently the Art collections at Leeds and Worthing have been put under the charge of the Librarian at each of these places, so that Mr. Lowe's appointment over the important Libraries at Leicester somewhat balances matters.

The Forty-seventh Annual Report of the Rochdale Public Libraries, Art Gallery and Museum Committee records that practically nothing but the ordinary necessary work has been done in the Museum for the year. The Committee approve of the formation of a War Museum, and acknowledge the receipt of the Geological collection, formed by the late W. H. Sutcliffe, and also of 179 cases of British Birds and Animals (query mammals) from Mr. Arnold Schofield.

The Reprints from the Smithsonian Reports for 1916 consist of the following interesting papers:—'Pirates of the Deep—Stories of the Squid and Octopus,'' by P. Bartsch; 'The Economic Importance of the Diatoms,' by A. Mann; 'Theodore Nicholas Gill,' by W. H. Dall; 'The Life and Work of J. H. Fabre,' by E. L. Bouvier; 'The Present State of the Problem of Evolution,' by M. Caullery; 'Some considerations on Sight in Birds,' by J. C. Lewis; and 'Narcotic Plants and Stimulants of the Ancient Americans,' by W. E. Safford.

At a recent meeting of the Lancashire and Cheshire Entomological Society, Mr. F. N. Pierce exhibited living larvæ of *Solenobia melanella* and *Diplodoma ferchaultella* from Northants., and pointed out that no male of the latter species was known; he drew attention to the differences in the form of the larval case in each instance and the method of the feeding of the larvæ. Mr. W. Mansbridge shewed a long series of *Lobophora carpinata* (*lobulata*) from Delamere parents, much suffused with fuscous and green in both sexes, but more strongly in the females; also a series of *Odontopera bidentata* showing a continuous pale transverse line formed by the joining up of the second series of spots.

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LONDON:

A. BROWN & SONS, LTD., 5 Farringdon Avenue, E.C.4

And at HULL and YORK.

Printed at BROWNS' SAVILE PRESS, 40, George Street, Hull, and published by A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London. July 1st, 1918.

AUG. 1918. No. 739
(No. 513 of current series.

THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

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RILEY FORTUNE, F.Z.S.

Smithsonian Institution
JUN 24 1920
Natural History Museum

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LONDON :
A. BROWN & SONS, LIMITED, 5, FARRINGDON AVENUE, E.C. 4.
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JUN 24 1920

NOTES AND COMMENTS.

THE WHITBY MUSEUM.

The Ninety-fifth Report of the Whitby Literary and Philosophical Society gives evidence of unusual zeal on behalf of the Officers of the Society during the past twelve months. Besides the usual report on the year's work, there are valuable local Natural History and Meteorological records, and a reprint of Mr. Sheppard's paper on the 'Implements of the Bronze Age in the Whitby Museum,' which appeared in *The Naturalist* for February last. For the frontispiece is an

The Whitby Museum.

illustration of the Whitby Museum, which we are kindly permitted to reproduce.

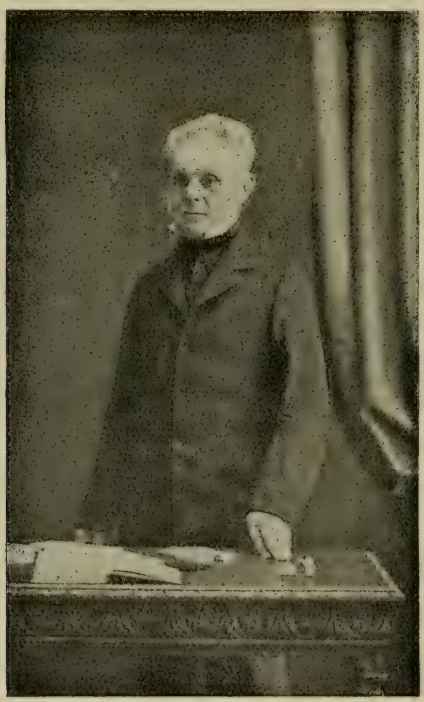
AN AVIATOR.

We notice the following in *The Yorkshire Post* of June 20th : —' I should like to voice a grievance felt by the village of Bempton near Flamborough. At this time of the year, there are many thousands of Guillemots and Razorbills (Guillemots in particular) nesting on Bempton Cliffs, and some thousand of eggs are annually gathered by the Bempton Cliff Climbers for food for the village and surrounding districts. Yesterday, in the middle of the afternoon, a seaplane traversed the cliffs from one end to the other (some three miles) firing a machine gun over the entire distance into the cliffs, which had the effect of bringing birds hurriedly off their eggs, creating a wild avian panic. In the act of hastily leaving the cliff, hundreds of eggs would be carried off the cliff and wasted

to Guillemot and man posterity in the sea. Again, the exposure of the eggs left them at the mercy of those avian felons the Jackdaw and Herring Gull, who were not slow to avail themselves of so tempting a dainty, and got their beaks busy among the eggs.' Some time ago the Yorkshire Naturalists' Union was successful in preventing the pleasure steamers from Bridlington and Scarborough from firing guns as they passed the Speeton Cliffs in order to let the trippers see the clouds of birds ; now we have an adjectival aviator playing the same game, presumably to amuse himself.

MARTIN SIMPSON.

Through the kindness of Mr. J. T. Sewell, J.P., we are able



to reproduce a portrait of Martin Simpson, who was for many years the Curator of the Whitby Museum. He was known for his early work among the Ammonites of the Yorkshire Lias, and was the author of several pamphlets on the Geology of the Whitby District and on Yorkshire Coast. The Yorkshire Geological Society is publishing a Memoir on Simpson in the next part of its Proceedings.

THE MUSEUMS' ASSOCIATION.*

The excellent results achieved at the Annual Conference of the Museums' Association held at the Town Hall, Manchester, on July 9th, 10th and 11th are some evidence of the desirability of our Educational Institutions 'carrying on' in War Time. In view of the difficulty of entertainment, etc., the Conference was curtailed to three days, but as a result of the lengthy sessions each morning and afternoon, and on one evening, probably more actual work was crowded in the three days than during any previous Conference. It was remarkably well attended, there being about 80 Delegates from England, Scotland, Wales and Ireland. To the great regret of the members, the President, Mr. E. Rimbault Dibdin, was prevented through illness from attending and giving his address. This was particularly unfortunate in view of the recent efforts of the Association to give more prominence to matters connected with the Art side of Museum work, an aspect which has been rather neglected by the Association in years gone by. However, by the efforts of the Local Secretary, Mr. Haward, and the General Secretary, Mr. J. Grant Murray, this aspect of the Association's work was well to the fore.

LOCAL PAPERS.

The members had their usual experience of hearing a few papers on elementary Museum matters, mostly by local authors, one result of its propaganda during the last quarter of a century being rather amusing. For years the Museums' Association has endeavoured to make the Education Committees interested in the Museums, and has advocated the appointment of special teachers to devote their time entirely to giving lectures to pupils in Museums and Art Galleries. This has at last been accomplished at Manchester, and possibly through being unaware of the Association's efforts, the various teachers concerned gave details of the nature of their work. The value of Museums in War Time was brought prominently forward, and no doubt impressed the various chairmen and members of committees who were present.

PAPERS READ.

Bearing more particularly upon the war were papers on: 'The Aims and Objects of the Imperial War Museum,' by Lieut. Charles ffoulkes; and 'Local War Museums,' by Charles Madeley. Dealing with educational aspects of museums were 'The Art Museum and the School,' by J. Ernest Phythian; 'The Museum in Relation to the School,' by (*a*) R. Saunsbury; (*b*) Mrs. B. Bell; (*c*) Miss B. Hindshaw; the Art side of Museum work being represented by: 'The Preservation,

* From *Nature*, July 18th.

Cataloguing, and Educational Value of Print Collections,' by Isaac J. Williams; 'The Museum in relation to Art and Industry,' by (*a*) Henry Cadness, (*b*) H. Barrett Carpenter; 'The application of Art to Industry, and its relation to Museum work,' by S. E. Harrison; 'Art Museums,' by Fitzgerald Falkner; 'Material and Design in relation to Craftsmanship,' by Joseph Burton. The more general subjects dealt with were: 'The Museum and Trade,' by Thos. Midgley; 'A Plea for the District Federation of Museums and Art Galleries,' by Robert Bateman; 'Arrangement of an Ethnographical Collection,' by Ben H. Mullen; 'Local Museums and their Rôle in National Life,' by Louis P. W. Renouf; 'Museum and Art Galleries Finances,' by E. E. Lowe; a little relief being given to the somewhat serious proceedings by a humorous paper on 'Packing and Removing a Museum of Geology and Antiquities in War Time,' by Thomas Sheppard. Before and after the meetings many members visited the Museums and Art Galleries for which Manchester is so famous. There was an informal dinner at the headquarters at the Grand Hotel on Wednesday evening, which was quite successful, under the chairmanship of Dr. W. E. Hoyle. The Lord Mayor of Manchester provided tea for the members at the Town Hall each day. The President for next year is Sir Henry H. Howorth, K.C.I.E., M.P., etc., and the Hon. Secretary, Mr. W. Grant Murray of Swansea. At the council meeting held at the close of the Conference it was agreed that the Association should meet again next year.

A STORY.

There is a story of a scientific man of a somewhat peculiar temperament, who went to heaven. He was not at all satisfied with things as they were there, so he went elsewhere. Still dissatisfied, he gathered a few cinders together and made a little place for himself, and when last heard of he was frizzling away 'on his own.' Charlie Chaplins and Pemberton Billings exist in all communities, and help to cheer us.

A SHEFFIELD EFFORT.

At a conference of the Museums' Association held some time ago, two or three of the members did not quite have the 'innings' which they apparently considered their position and importance warranted, so they held a little conference 'on their own.' One of these became an 'editor,' another an 'Hon. Treasurer,' and still another read a paper and took part in discussions, and referred to 'future conferences'; thus amidst a 'milky way' a discontented trio shone as stars of the first magnitude. The services of the Lord Mayor of Sheffield, and of the Chairman of the Sheffield Museums Committee were requisitioned, there was a 'Conference Dinner,' and papers on

the somewhat original subjects, 'Museums and Education,' and 'War Museums,' were read and discussed. But as to the results of this Conference the daily press (except for a brief report in a Sheffield paper), the scientific, technical and museum journals, remained silent. Consequently it looked as if the world was not to benefit from the deliberations of these wise men.

A CIRCULAR.

But, on February 19th, we received a circular to say that a 'Report' of the Conference held at Sheffield in October, 1917, would be ready for distribution *in March*, 1918, and from the number of copies said to have been already subscribed for, it was evident that each person present at the Conference was liable to be guilty of paper-hoarding. However, we read:—'in order to decide the extent of the issue which is likely to be required for the British Empire and America the Editor would be obliged if you would kindly let him know *before the end of February* how many copies you may wish to take.' How our friends in America, Cape Colony, India and Australia were to receive their circulars and reply to them within 9 days, we do not know, neither can we understand why the Esquimaux, the Chinese and the South Sea Islanders should have been debarred from the Sheffield feast of wisdom and flow of soul. Anyway, we ran the risk of immediately ordering our copy, and then, with the patience of a man fasting in a wilderness for forty days and forty nights, only three times as long, we waited for the Report. We next received a printed form bearing the names of the Editor and Treasurer, dated *June 27th*, to the effect that the Report was *now ready*, price 2/6* and would be sent '*immediately* on receipt of remittance.' We at once arranged an overdraft at our bankers, forwarded the money, and by July 1st, the Report, in a quite ordinary wrapper, and not registered, was received. And on the evening of July 1st, we had read, marked, learned and inwardly digested its contents, and yet live.

THE REPORT.

By the aid of occasional blank pages, half-page blanks, ample spaces between each paragraph, well-spaced lines, lists of towns represented, and of delegates, a reprint of 'an Abridged Catalogue of Loan Collections of Museum Cabinets . . . . and the conditions under which they are issued' (presumably at Sheffield), letters and lists of persons who were 'unfortunately unable to be present,' and verbatim reports of the papers and the talks thereon, the Report extends to 103 pages, though in

* A welcome surprise, as the first circular stated the price would be 3/- after March 1st.

these days of paper shortage much paper might have been saved, without detracting from its value; and we must express surprise that the editor considers a brown-paper cover sufficient as a shrine, whatever the opinion of its readers may be.

THE 'ASSOCIATION' (?)

An examination of the List of Delegates shows that there were *eighteen* curators present, principally from small places near Sheffield, and we must admit that some of them are unknown to us, and rarely, if ever, had previously shown sufficient interest in Museum work to attend the Annual Conferences of the Museums' Association, even during the many years that the editor of the present Report was the Hon. Secretary of that Association. This might perhaps not be of much moment but, on the first page of the Report it states that 'A Conference of Members of the Museums Association' was held. The Lord Mayor very carefully stated: '*The notification I have in my hand represents* that this is a Conference of the members of the Museums' Association,' and from his remarks it is evident that the Chairman of the Sheffield Museum Committee was under the same impression. We contend that it was not in any way a meeting of the Museums' Association, any more than it was a meeting of golfers or masonic brethren. True, some of those present happened to be members of the Museums' Association, just as some happened to be golfers, and others masons. With the few exceptions—already explained—the members of the Museums' Association, although aware of the existence, but apparently not impressed with the importance of the Conference—were conspicuous by their absence. With about one possible exception, not a single person holding any position in the Museums' Association, as constituted to-day, was present. Nor were Curators there from any of the National Museums and Art Galleries in England, Wales, Ireland or Scotland, nor from the museums at Liverpool, Manchester, Norwich, Glasgow, Leicester, York, Hull, Nottingham, Newcastle, Ipswich, Swansea, Chester, Exeter, Sunderland, Maidstone, Cardiff, Brighton, Stoke, Carlisle, Worcester, Hastings, Aberdeen, Dundee, Perth, Rochdale, a few places mentioned at random, whose Curators are familiar figures at the Annual Conferences of the Museums' Association.

A SUGGESTION.

If the Sheffield meeting really was a Conference of the Museums' Association, it is rather surprising to find, on a neatly printed programme issued in connexion with the recent Conference of that Association at Manchester, the Editor of the Sheffield Report—naively suggesting that the Association's Conferences should be discontinued until after the war, and that its organ, *The Museums Journal*, be issued quarterly

instead of monthly. Needless to say the suggestions received no support, but one wonders why they were made, as on page 70 of the Sheffield report, one of the three largely responsible for that Conference, states 'It has been a pleasure to have the inspectors here, and we hope we shall have them *at subsequent conferences.*' It *would* have been so nice if the Museums' Association proper had ceased its work, so that the Pretender could have been alone in the field. No, we have not room for two Museums' Associations in this country, and if the best aims of museums and art galleries are to be served—and presumably these are the reasons for the existence of such an Association, we must put our individual feelings on one side and work for the common good. Everybody cannot be the president, or editor, or secretary, and if any particular person does not achieve greatness so soon as he would wish, he must wait patiently, and work, and greatness may possibly be thrust upon him.

CONTENTS OF REPORT.

To come to the Report itself. Mr. E. Howarth has an introductory paper on 'The Co-ordination of Museums with direct General Education' (8 pp.), with the 'Abridged Catalogue' (6 pp.) already referred to; 'Scheme for Scholars visiting the Salford Museums,' (5 pp.), by Ben H. Mullen, 'Report on School Picture Collections in Aberdeen,' (3 pp.), by Robert F. Martin; 'The Workshop and the School,' (4 pp.), by Henry Cadness, read in the author's absence by R. F. Martin; 'War Museums' (7 pp.), by H. Bolton, and 'Village War Museums' (4 pp.) by Robert P. Martin (is this still another member of the Martin family, or evidence of faulty editing?). We have thus accounted for 31 pages actually occupied by the papers read at the Conference—the remainder come mostly under the head of talk.

CONFERENCE OF DELEGATES.*

The annual conference of Delegates of Corresponding Societies of the British Association was held in the Geological Society's rooms, Burlington House, on Thursday, July 4th. At the morning session Dr. F. A. Bather gave his presidential address entitled 'The Contribution of Local Societies to Adult Education.' In this Dr. Bather endeavoured to summarise the membership, and estimate the strength of the various scientific societies in Great Britain, show the part they were playing in the adult education of the country, and make suggestions for the further usefulness of these societies. His statistics had been difficult to compile and were admittedly incomplete, but it was demonstrated that while some centres were well provided for, in the way of natural history and allied science societies,

* From *Nature*, July 11th, pp. 376-6.

there were many large areas which appeared not to be served by any societies of the kind. Discussion was invited, which lasted for the remainder of the morning.

A YORKSHIRE EXPERIENCE.

The general feeling was that, desirable as it is that everything should be done to increase the popularity and work of our scientific societies, the present time was inopportune, seeing that so many of the young and vigorous men were occupied with more important duties. In his reply to the discussion the president attached particular importance to the remarks made by the delegate from Hull, in reference to the excellent work being accomplished in Yorkshire, where there are far more important societies than in any other county. It was pointed out that, notwithstanding the elaborate and systematic instruction in Nature-study in the schools, and the formation of Nature-study societies for teachers, the result unquestionably was that there was less apparent interest taken in natural history by young men and women after leaving school, and even before the war the membership of the societies had shown an apparent decrease. The conference decided to endeavour to prepare a list of all the scientific societies in the country.

AFFORESTATION, ETC.

At the afternoon session Mr. Martin C. Duchésne read an admirable paper on ' Afforestation,' Sir Charles Bathurst and many of the delegates taking part in the discussion. The lecturer dealt at length with the urgent question of the increase of our home forests, and made many excellent suggestions towards the accomplishment of this. It was felt that the delegates could get the societies they represented to use their influence to further the growth of timber throughout the country, and one practical proposition was made, namely, to form an Arbor Day throughout the country. Such a suggeston, made on July 4th, was also complimentary to our American friends, who have had an Arbor Day for many years. A short note from Mr. P. Westell, who was not present, was read, the gist of which seemed to be that some authority should make grants to local museums, but how and by whom these grants should be made the author did not seem to know, and the delegates did not appear to be able to help him. On behalf of Mr. B. B. Woodward a ' typomap ' of the British Isles was exhibited, upon which naturalists may record the distribution of species. This will probably be circulated among the various societies. More than one member commented on the fact that this year, when the necessity for directing attenton to the national value of science seemed so great, the British Association *for the advancement of science* had decided to have no general meeting.

———

Naturalist,

CONCHOLOGICAL CLASSIFICATION, VARIATION AND NOMENCLATURE.

J. W. TAYLOR, M.Sc.

IDENTIFICATION.—In *The Journal of Conchology* (Vol. X., p. 365), Mr. B. B. Woodward has essayed to clear up several doubtful conchological subjects and amongst others he has attempted to clarify the conception of the species of British *Viviparæ*. He gives an unsatisfactory and entirely misleading resumé of Mr. Sylvanus Hanley's observations upon the Linnean specimens of the genus (Ipsa Linnæi Conchylia, 1855, pp. 376-7) inaccurately stating that Mr. Hanley, finding the Linnean specimens to consist solely of *Vivipara contecta*, thereupon assumed that species to be the Linnean *Helix vivipara*, and that he had then very ingeniously attempted to explain away Linné's descriptive term 'imperforata,' presumably to make it fit the *V. contecta* which Mr. Woodward erroneously affirms to be the only species of *Vivipara* in the Linnean Collection.

All this and more is quite incorrect, as Mr. Hanley gives a very excellent account of the species to which little exception can be taken.

Some time ago, Mr. Roebuck and I were authorised by the Council of the Linnean Society of London to overhaul the land and freshwater shells contained in the Linnean collections in their possession and we found the specimens of *Vivipara* to be chiefly *Vivipara vivipara* (L.), and that two of them bore in Linné's own handwriting the significant numerals '603,' the serial number distinguishing this species (*Helix vivipara*) in the 10th edition of the *Systema Naturæ*, and therefore are without doubt the true Linnean types.

CLASSIFICATION.—Mr. Woodward (*op. cit.*, p. 353), and again in conjunction with Mr. Kennard (Post Pliocene Non-Marine Mollusca of Ireland, 1918, p. 161) essays to improve the classification of the *Hyaliniæ*, by uniting under the genus *Polita* Held the various species which I have separated under the headings of *Euhyalinia* and *Polita* (Monograph, Vol. III., pp. 18 and 67) ; but as I shall now endeavour to show, this suggested grouping is such an incongruous medley of species as to render their proposal not merely useless, but positively retrogressive in its influence, for it should be borne in mind that the Zonitoid shells are probably not monophyletic, but composed of diverse groups, whose history and lineage have yet to be elucidated, but which have arrived at a similar stage of shell degeneration, and therefore exhibit a superficial similarity misleading to those who have not closely studied the subject.

The genus *Polita* is said to be especially typified by *P. nitidula*, and represents a group markedly different in numerous

1918 Aug. 1.

respects from *Hyalinia cellaria* and its close allies, which I have classified as *Euhyalinia*, but which Kennard and Woodward propose to unite with *Polita*.

The group *Polita*, as represented by *P. nitidula*, has a shell with a comparatively dull and waxen aspect, usually somewhat loosely coiled and more widely umbilicated, while *Euhyalinia* has typically a brilliantly glossy shell, usually more compactly coiled and with a more contracted umbilicus.

The animal inhabitant also presents more or less constant differences; in *Euhyalinia* the lateral furrow on the right side of the body is distinctly present, whereas in *Polita* this groove (which is probably a vestige of the formerly external spermatic channel of the ancestral form) is not perceptible, and in addition there are differences in the character of the pallial lobulation in the species of the two groups.

Internally the differences between *Polita* and *Euhyalinia* are even more decisive and entirely preclude the feasibility of the union which Kennard and Woodward propose.

In *Euhyalinia* the sexual system shows a well developed glandular pad, which envelops the upper part of the vagina and represents the digitate glands of *Helix*; there is also a remarkable and peculiarly looped epiphallial expansion of the vas deferens and the penis is innervated from the right cerebral ganglion; while in *Polita* the two first characters are quite deficient and the penis is stated to receive its innervation from the pedal ganglia.

In *Euhyalinia* also, the retractor of the right ommatophor passes between and separates the male and female organs of the sexual system as in the typical Helices, whereas in *Polita* as properly restricted, the retractor is quite free from the sexual complex as in the Xerophiloid Helices.

In *Euhyalinia* too, the median teeth of the radula are smaller, and in some cases conspicuously smaller than the neighbouring laterals, which are usually tricuspid in plan, while the marginal teeth are typically few in number; whereas in *Polita* the median teeth are quite as large as the adjacent laterals, which in this group are usually bicuspidate, while the aculeate marginals are more numerous.

Nomenclature.—Kennard and Woodward (Post Pliocene Non-Marine Mollusca of Ireland, 1918, p. 111, *et seq.*) are quite ruthless in their condemnation of Varietal nomenclature as adopted by those who are striving to study intensively the range of variation in the various species of mollusca, and need a full and accurate nomenclature adapted to their requirements. Messrs. Kennard and Woodward, however, cling to ancient methods, which though ample enough for the modest requirements of science in former times, or for the general student of the present day, are quite out of harmony with the minutely

accurate and strictly precise modern methods of investigation and are not supported by the great leaders of scientific thought, for Prof. Huxley held the conviction that sooner or later we should possibly give up even attempting to define species and be compelled by stress of circumstances to adopt the principle of recording the varieties which cluster round definable types. Darwin and Wallace, our greatest authorities on Evolution, considered varietal differences to be of the greatest importance ; while Prof. E. von Martens, the famous conchologist, was of opinion that it was desirable that every local form well marked zoologically or geographically should have a distinct name ; and I am also quite in accord with the venerable geologist, Rev. Prof. Bonney, who advocates the use of varietal names in preference to those of specific rank for forms of doubtful status, such nomenclature while being expressive of the differences, keeps prominent the relationship of the doubtful forms, and remarks that the tendency to individualism evidenced by the leaning to specific names tends to promote a mental habit very fatal to real scientific progress.

However, in the light of the unsparing condemnation of varietal nomenclature expressed by Kennard and Woodward, and their bold assertion that there is no scientific utility in applying names even to the culminating points of any line of variation, and that such action is merely wasted energy, we may instructively examine the Lists of British Non-Marine Mollusca prepared and published by those gentlemen for the guidance and help of collectors and other interested persons, which presumably only include names which in the opinion of the authors are worthy of attention and record, for if the strong condemnatory opinions they have so vigorously expressed are consistently and honestly held, we should naturally expect few or no varietal names to appear in a list compiled by themselves and over which they had full authority and control.

In 1903, Mr. B. B. Woodward compiled a list which, strange to say, comprised the names of fourteen varieties, chiefly slugs ; but in the new and revised edition (1914), prepared in collaboration with Mr. Kennard and presumably embodying all the fruits of the eleven years additional experience and study, we find that instead of a decrease, there is an enormous increase in the number of accepted and adopted varieties, as more than three hundred additional names have been approved and included therein, including one described and named by Mr. Woodward himself, which appertains to *Pisidium*, a group of shells to which he has devoted considerable attention, the results being published in the form of a Monograph, and although this work has been and is still subjected to very severe criticism, and its reliability and accuracy very strongly impugned by competent and experienced authorities,

yet it undoubtedly contains much meritorious matter and adds considerably to our knowledge of the group; it also demonstrates that the author has found that as his studies are more closely pursued a varietal nomenclature becomes increasingly desirable and there can be little doubt that as knowledge of the subject accumulates, a precise varietal nomenclature will become increasingly imperative and helpful. It is therefore of some interest to learn that the able and well-known scientists now actively engaged upon the study, rectification and revision of the British *Pisidia* have adopted the principle of varietal nomenclature to distinguish noteworthy specific modifications in preference to the cumbrous and impracticable methods of treating variations advocated by Mr, Woodward.

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A Corncrake Puzzle.—On July 10th, a neighbour asked me to look at a strange bird that had been caught in his garden that afternoon. To my great surprise it was a young Corncrake, about half fledged, but not quite able to fly. Its primaries and secondaries were about half in and about half out of the pen quills, and little bits of the black nestling down were interspersed among the budding upper wing coverts. It was apparently quite well and active, and took quick advantage when given its liberty to run for cover and to make the chance of catching it again almost an impossibility. That a young Corncrake should be in a garden when haymaking was proceeding in the surrounding fields, would not occasion a moment's surprise, excepting that we were not aware that there were any Corncrakes in, or near, the village. The nearest 'craking' bird this season would be quite three-quarters of a mile from where the young bird was caught, and on the other side of the river. The young bird could not have crossed the river excepting by a circuitous route over a bridge—which is out of the question. I have questioned the tenants of the adjoining fields and they have not heard a Corncrake this year, and it is quite six years since I heard one in the village. That a young half-fledged and flightless bird should be taken within a hundred yards of my house, not only caused me great surprise, but has been a puzzle to me ever since. Are some male Corncrakes dumb? (Judging from various conversations I have heard at sundry times I believe many people wish they all were). On the other hand it may throw a little light on another Corncrake problem. For years we have been recording the continual decrease of Corncrakes over very wide areas, and relying almost entirely on our ears for the observations—at least, I have. Then, as if to mock me, this young bird, which has undoubtedly been bred in the near neighbourhood, reports itself almost at my front door.—H. B. Booth, Ben Rhydding.

Naturalist,

THE SPIDERS OF YORKSHIRE.

WM. FALCONER,
Slaithwaite, Huddersfield.

(*Continued from page 197*).

V.C. 65., has been very little worked, the few records which have accrued being the result of visits paid by the Yorkshire Naturalists' Union.

The captures made in recent years by naturalists in the county have been noted from 1901 onwards, at first infrequently but since 1908 more commonly, in *The Naturalist* and the transactions of certain societies. For all these the bibliography on p. 257 should be consulted.

Of the 579 species which are known to inhabit the British Isles, 320 have up to the present time been found in Yorkshire. Tabulating them according to different areas, the E. Riding (V.C. 61) has 237 ; the N. Riding 244 (V.C. 62-243, V.C. 65-67) and the W. Riding 274 (V.C. 63-240, V.C. 64-234). Much, however, still remains to be done before the total spider population of the county and its distribution can be ascertained. A great deal of its area (and that the most promising) is still in an arachnological sense virgin ground. Its large size, diversified surface, varied geological formation, extensive wild uncultivated districts and heather clad tracts, woods, commons and long seacoast present a vast variety of habitats, ranging from high hills to the sea level, each contributing its quota of forms peculiar to itself, so that search anywhere, especially on the littoral and higher altitudes, would probably result in additions to the present list, some possibly new even to science or to Britain. The best results, however, are to be obtained in one's own neighbourhood, familiarity with the surface features of a district being an essential element of success by directing the attention to those special circumstances of environment, in which alone so many of our spiders can be found.

It has already been seen that the number of rarities in the county is very large, and at the time of their capture the following were :—

(1) NEW TO SCIENCE and still peculiar to Yorkshire—*Clubiona facilis* Camb. (F. Rhodes) ; *Maro minutus* Camb., *M. humicola* Falcr.

(2) NEW TO SCIENCE—*Micryphantes beatus* Camb., *Maro falconerii* Jacks., *Eboria caliginosa* Falcr.

(3) NEW TO THE BRITISH ISLES—*Erigone spinosa* Camb. (T. Stainforth), *Hypselistes florens* Camb., *Notioscopus sarcinatus* Camb. (J. W. H. Harrison), *Gongylidiellum paganum* Sim., *Diplocephalus protuberans* Camb., ♀.

(4) UNNAMED AND UNDESCRIBED—*Oreontides firmus* Camb. (taken about same time in Northumberland), *Diplocentria rivalis* Camb. (some months before in Staffordshire), by Dr. Jackson.

(5) UNRECORDED AS BRITISH—*Tapinocyba insecta* L. Koch (previously taken in Northumberland by Dr. Jackson).

There are others also, which from their county or general scarcity or distributional range are worthy of special mention:

V.C. 61, 62. *Entelecara thorellii* Westr., *Mengea warburtonii* Camb., *Xysticus erraticus* Bl., *Hahnia nava* Bl.

V.C. 61, 63. *Theridion impressum* L.K., *Prosopotheca monoceros* Wid., *Tmeticus affinis* Bl.

V.C. 61, 64. *Entelecara trifons* Camb., *Baryphyma pratensis* Bl., *Cercidia prominens* Westr.

V.C. 62, 63. *Porrhomma egeria* Sim., *Wideria fugax* Camb.

V.C. 62, 64. *Syedra innotabilis* Camb., *Coelotes terrestris* Wid.

V.C. 63, 64. *Theridion vittatum* C.L.K., *Gongylidiellum paganum* Sim., *Hahnia pusilla* C.L.K.

Less restricted but still few in number are *Lophomma subaequale* Westr., *Typhochrestus digitatus* Camb., *Hillhousia misera* Camb., *Sintula cornigera* Bl., *Coryphæus distinctus* Sim., *Hahnia helveola* Sim., *Panamomops bicuspis* Camb.

The arrangement and nomenclature of the families and genera here adopted are mainly those of Simon's 'Histoire Naturelle des Araignées,' 2nd edition. For the synonymy of the various species reference may be made to the Rev. O. Pickard Cambridge's 'List of British and Irish Spiders,' November, 1900, any departure from it being noted in the text, so that any spider may be readily traced. With the exception of eleven, which, however, rest on fully recognized authority, I have either collected or seen examples of all the Yorkshire species, but in a matter of this kind, accuracy being absolutely essential, I have not always relied on my own knowledge and acumen, but when occasion arose, submitted specimens for attestation or confirmation, and, in my novitiate, for identification, to the Rev. O. Pickard Cambridge and Dr. Jackson, to whom my very best thanks are therefore due, as well as to the following for authenticated records or collections or both: Messrs. Stainforth and Parsons, Hull; W. P. Winter, Shipley; G. B. Walsh, Linthorpe; J. W. H. Harrison, Middlesborough; Rev. R. A. Taylor, now of Burnley; S. Margerison; and to the Right Hon. the Earl of Dartmouth, J. J. Burton Esq., Nunthorpe, Sir. J. M. Spencer-Stanhope, Cannon Hall, for access, freely granted, to woods owned by them in various parts of the county.

BIBLIOGRAPHY

OF BOOKS AND PAPERS CONTAINING REFERENCES TO YORKSHIRE SPIDERS:—

J. Blackwall.

1861–4.—The Spiders of Britain and Ireland. *Ray Society*, 2 vols.; 273 species, figures and descriptions.

Rev. O. Pickard Cambridge.

1879–82.—The Spiders of Dorset, with Descriptions of other Species

not found in that County. *Proc. Dorset Field Club*, 2 vols.; 518 species, figures few.

1900.—List of British and Irish Spiders (published for the author).

1902–1914.—On New and Rare British Arachnida. *Proc. Dorset Field Club*—Vol. XXIII., 1902; Vol. XXIV., 1903; Vol. XXVI., 1905; Vol. XXVII., 1906; Vol. XXVIII., 1907; Vol. XXIX., 1908; Vol. XXX., 1909; Vol. XXXI., 1910; Vol. XXXV., 1914.

1907.—Victoria County History of Yorkshire, Vol. I., pp. 286–293; Section Arachnida, 221 species.

1908.—*Erigone spinosa* Camb. at Saltend Common, Hull. *The* Naturalist, pp. 378–9.

Dr. A. Randell Jackson.

1905.—The Genus Tapinocyba. *Trans. Nat. Hist. Soc. of Northumberland, Durham and Newcastle-upon-Tyne* (New Series), Vol. I., Part 2, plates and descriptions.

1912.—On British Spiders of the Genus Microneta. *Ibid.* (New Series). Vol. IV., Ap., pp. 117–142; plates.

1913.—On some New and Obscure British Spiders and Genus Porrhomma. *Trans. of Notts. Nat. Soc. for* 1911–12; plates, 2; figures, 34.

1916.—On the Nomenclature and Identity of some little-known British Spiders *Ann. and Mag.* N.H. (Series 8), Vol. XVII., Feb., pp. 163–171.

W. Falconer.

1901.—*Caledonia evansii* Camb. in England. *Science Gossip* (New Series), Oct. and Nov.

1901.—*Tigellinus furcillatus* Menge in the Wessenden Valley, S.W. Yorks. *The Naturalist*, September.

1905–1910.—Papers on the Arachnida of the N.E. Coast of Yorkshire. *The Naturalist*, 1905 (Feb.); 1906 (Jan.); 1910 (Jan. and Dec.).

1908.—*Diplocephalus beckii* Camb. near Huddersfield. *The Naturalist*, April.

1909.—*Cornicularia kochii* Camb.: With a Key to the British Corniculariæ. *The Naturalist*, August (pp. 295–8) and September (pp. 332–3); plate and figures in text.

In the Arachnida of the following places (*The Naturalist*):—

1909.—Cawthorn, November.
1910.—Upper Teesdale, July; Malham, September.
1911.—Harewood, June; Meltham, October.
1912.—Riccal, June; Tanfield, August.
1913.—Roche Abbey, May.
1914.—Knaresborough, June.
1915.—Bishop Wood, September; Hebden Bridge, September; Sawley, November.
1916.—Bolton Woods, September.

1910.—A New Genus and Species of Spider (*Eboria caliginosa*). *The Naturalist*, Feb., pp. 83–8; plate.

1910.—Note on *Eboria caliginosa* Falcr.: Stridulating Apparatus, etc. *The Naturalist*, July, pp. 293–4.

1910.—*Agroeca celans* Bl., a Spider new to Yorkshire, and *Pachygnatha listeri* Sund. in Yorkshire. *The Naturalist*, March.

1910.—Abnormality in Spiders. *The Naturalist*, May, pp. 199–203, and June, pp. 229–232: Figs. in text.

1910. Keys to the Families and Genera of British Spiders and to the Families, Genera and Species of British Harvestmen and Pseudoscorpions, *The Naturalist*, June, September and December. Afterwards revised, indexed and issued in book form, February, 1911.

1911-1918. In Annual Reports on Yorkshire Arachnida *The Naturalist*, January—1911, 1912, 1913, 1914, 1915, 1916, 1917.
1911. New and Rare Yorkshire Spiders, *The Naturalist*, August, pp. 283-8, figs. in text.
1912. Yorkshire Arachnida in 1911, *The Naturalist*, February, pp. 52-4.
1913. On the Origin of the Yorkshire Araneidal Fauna, *The Naturalist*, February, pp. 111-114; and March, pp. 131-8.
1914. Yorkshire Arachnida in 1912-13, *The Naturalist*, March, pp. 84-89.
1916. Foreign Spiders in Yorkshire, *The Naturalist*, Nov., pp. 350-1.

R. Gilchrist.
1906. New Yorkshire Spider Records, *The Naturalist*, June, p. 200.

T. Stainforth.
1908. Arachnida of Yorkshire Naturalists' Union Excursion to Hornsea Mere, *The Naturalist*, p. 307.
1908. Notes on *Erigone spinosa* Camb. from Saltend Common, Hull, *The Naturalist*, October, p. 385.
1908. A Preliminary List of the Spiders of the East Riding, *Trans. Hull Sci. and F. Nat. Club*, Vol .IV., part 1 (93 species).
1909. Spiders, etc., of the East Riding, *Hull Museum Publications*, No. 59 (177 species).
1911. Notes on some Scarborough Arachnida, *Trans. Hull Sci. and F. Nat. Club*, Vol. IV., part 3, p. 146.
1915. *In* The Guests of Yorkshire Ants, *The Naturalist*, December.
1916. Distribution of Spiders in the East Riding, *The Naturalist*, September and December.

H. C. Drake.
1908. Spiders New to the Scarborough District, *The Naturalist*, August, p. 299.

E. A. Parsons and T. Stainforth.
1909. Notes on East Riding Spiders in 1909, *The Naturalist*, Dec., pp. 438-440.
1911. Additions to the List of East Riding Spiders, *Trans. Hull Sci. and F. Nat. Club*, Vol. IV., part 3, pp. 162-5.

E. A. Parsons.
1910. List of East Yorkshire Spiders, Harvestmen and Pseudoscorpions collected during 1909 (89 species), *Trans. Hull Junior F. Nat. Soc.*, pp. 18-22.

W. P. Winter.
1909. Spiders of the Bradford Area, *Bradford Scientific Journal*, April.
1911. Spiders of the Airedale and Wharfedale Area, *The Naturalist*, January, pp. 70-74; also 1912, February, p. 54.
1912. *In* The Arachnida of Tebay, *The Naturalist*, October.
1915. *In* The Arachnida of Sawley, *The Naturalist*, July; *also* Settle, September.

Dr. J. W. H. Harrison.
1909. Spiders of the Middlesbrough District, *Mag. of the Middlesbrough High School*, April and December.
1910. Paper with same Title, *Trans. Cleveland Nat. Hist. Soc.*, pp. 224-240 (Plate).
1914. Cleveland Spiders, *The Naturalist*, August, pp. 245-8.
1915. New and Rare Yorkshire Spiders, *The Naturalist*, January, pp. 26-7.

Rev. J. E. Hull.
1910. Papers on Spiders: I.—The Genus *Tmeticus* and some Allied Genera; II.—Some Northern Records for 1909 (Plate), *Trans. Nat. Hist. Soc. of Northumberland, Durham and Newcastle-upon-Tyne*, New Series, Vol. III., part 3, pp. 573-590.

In many cases in the following list the absence or paucity of records will probably be found to be due to the areas in question having been imperfectly investigated. As some indication of the wealth or poverty of the county's araneidal fauna, the numbers placed after the names of families and genera (*e.g.*, Fam. *Drassidæ*, 7-22; genus *Drassus*, 4-8), denote the proportion of Yorkshire to British species. All entries other than my own, except where necessary, are distinguished by the collector's initials, or their source indicated, the abbreviations employed being :—

E.B.=Mr. Bilton.
F.B.=Mr. Booth.
J.A.B.=Mr. J. A. Butterfield.
R.B.=Mr. Rosse Butterfield.
W.R.B.=Mr. W. R. Butterfield.
C.=Dr. Corbett.
H.V.C.=Mr. H. V. Corbett.
H.C.D.=Mr. Drake.
J.F.=Dr. Fordham.
F.=Mr. H. E. Forrest.
H.M.F.=Mr. Foster.
R.G.=Mr. Gilchrist.
J.G.=Mr. Greenwood.
J.W.H.=Mr. Harrison.
C.H.=Mr. Hastings.
S.M.=Mr. Margerison.
R.H.M.=Dr. Meade.
C.M. Mr. Mosley.
G.H.O.=Dr. Oliver.
E.A.P.=Mr. Parsons.
F.P.=Mr. Perry.
F.R.=Mr. Rhodes.
T.S.=Mr. Stainforth.
T.St.=Mr. Stringer.
R.A.T.=Rev. R. A. Taylor.
G.B.W.=Mr. Walsh.
W.E.L.W.=Mr. Wattam.
W.P.W.=Mr. Winter.
S.G.B.I.=Spiders of Great Britain and Ireland.
H.M.P.=Hull Museum Publications.
V.C.H.=Victoria County History of Yorkshire.
V.C.=Watsonian Vice County.
Y.N.U.=Union meeting at the particular place mentioned.

(To be continued)

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The Bempton Peregrines.—On May 13th, when climbing commenced at Bempton, the Peregrine Falcons had two eggs in the old eyrie. John Hodgson, who went down to look at them, reports that they looked old and dirty. There was no more climbing at that end of the cliffs and when the eyrie was again looked at on 24th June the young had flown. Whether both got safely away it is impossible to say, as the climbers purposely left the place absolutely quiet, and their ordinary climbing did not extend beyond Hartley Shoot.—E. W. Wade.

Mason Bee at Whitby.—During early June I frequently noticed a specimen of this bee in my garden, and later in the month found a cluster of mud cells built between the window frame and sash of a room, the window of which facing south, having been left slightly open. There were 25 or 30 cells in two layers all closely sealed, and each containing a ball of honey and pollen, on the top of which a small grub attached by its posterior claspers was feeding. Being obliged to remove the colony they were placed on a wall under a plant pot, but enemies were evidently attracted, perhaps by the strong odour of the honey, and have prevented any further observation.—J. T. Sewell, Whitby, July 6th, 1918.

NOTES ON THE NESTING, SINGING AND SOME OTHER HABITS OF THE COMMON WILD BIRDS OF THE SCARBOROUGH DISTRICT.

W. GYNGELL.

What is here called the Scarborough district is included within a twelve-mile radius of the town. It embraces heather-covered moors with their slopes clothed with furze or bracken, more barren or cultivated chalk hills, wooded ravines and lowland woods of deciduous or fir trees, corn and grass fields, lanes bordered with brambles and coarse herbage, peaty carrs, rugged cliffs, rapid running moorland streams and—within the Borough—a mere of several acres.

It would be difficult to find a patch of land of equal size elsewhere in Britain providing suitable breeding haunts for so many kinds of birds. It is noteworthy too that several species here reach the eastern boundary of their breeding haunts in Britain.

Within the Borough boundaries are provided suitable nesting haunts for field, woodland, hedge-row and garden-loving birds, as well as those resorting to cliffs, tall buildings and reedy meres, whilst the protection afforded by town restrictions upon shooting adds very materially to the safety of any species taking up a town residence here. The wooded Olivers Mount, the Spa Grounds, the Cemetery, the Castle Cliff, the recently extended Mere, together with grass and corn fields that are within the urban district are *annually* resorted to for nesting purposes by *more than fifty different species of wild birds* (these are indicated by an asterisk before the name of each). Whilst another dozen species might be added as occasionally nesting in this circumscribed area.

The following notes, each written down when the observation was made, are now put together after twenty-nine years' residence in the borough, the writer having previously resided and made bird notes for some years in the County of Somerset. Summer holidays spent in south-eastern and northern Britain have also helped him to compare the Avifauna of this neighbourhood with that of Britain taken generally. A note of every bird's egg found from the year 1871 to the present date has been made at the time of finding.

Even in a long experience it is not easy to make many really unusual observations. The anatomy, morphology and physiology of the house sparrow or the herring-gull may be found in any really good book on birds, but such records as the *weight* of a sparrow's egg or the *date* when the Chaffinch ceases its summer song have been rarely if ever noted. Such notes have a very bald look when appearing in print and rather give the impression that their author is a 'soulless' sort of person. I hope it is not so. Only the commoner species of birds are here dealt with. The full and complete local avifauna, including accounts of the rarer species and accidental visitors may be found in that magnificent work Nelson's 'Birds of Yorkshire.'

*The Mistletoe Thrush (*Turdus viscivorus* L.). By some people locally called 'Mistletoe,' and by them and others often confounded with the fieldfare when seen in the spring and autumn migratory flocks. This is a very common bird in our town and district throughout the year.

Tyrannous here, as elsewhere in spring, it drives crows, jackdaws and other birds larger than itself from its 'claim,' whilst in autumn a single bird will sometimes take possession of a garden rowan or service tree until it has been entirely stripped of its red berries in which probably no other bird has been allowed any share.

Commencing to sing almost immediately the days begin to lengthen (I have actually heard it on December 21st), its loud song may be heard

daily until May 25th, when it ceases, not to be resumed again until some bright mid-winter day.

The large nest, usually of grass and perhaps some moss, I have found on occasion to contain many other substances, the full list being as follows: grass, dead or green, moss, lichen, bark, sticks, leaves, dead or living, roots, wool, feathers, scraps of newspaper, string and rags. Almost invariably placed in the strong fork of a fair-sized tree, the height varying from four to forty feet. I have also found it, but very rarely, in a hedge. April 5th is my earliest date for finding eggs. Four is the number found in 78% of the nests *examined after the bird had commenced sitting*. The other 22% of nests contained five eggs. I have never found one containing more. In 28% of Song-thrush's nests and 37% of the Blackbird's nests examined the number of eggs has been five. The average weight of an egg of this bird is ·31 oz.

I have observed that in spring time the Mistletoe-thrush is more addicted to flying about in pairs than is any other member of the thrush tribe.

All who have studied any wild animals must have noticed how different even under the same circumstances may be the behaviour of members of the same species; and here are two cases. A Mistle-thrush sitting upon her nest on a broken spruce-fir branch allowed me to climb the tree and stroke her back with my hand before she left the nest. Another bird, whose nest contained but two eggs, flew at me again and again most menacingly when I approached her possessions.

*The Song Thrush (*Turdus musicus* L.). Known to the natives here as the throstle, is resident and common enough nearly all through the year, although there are times when this and some other resident birds may be sought in vain. In the winter months, when it is less common than the blackbird, the Song Thrush leaves the woods and seeks more open country, occasionally feeding upon haws. Individual birds of this species may on rare occasions be heard singing on any mild autumn or winter's day. As spring approaches the number of singing birds steadily increases, but few may be heard after the end of June. A very free singer its voice may be heard from 2-9 a.m. until 9-30 p.m., often after stars have begun to shine. In early summer days, on bush or tall tree tops. Once I saw one singing on the roof of a tall town house. The Song Thrush uses a greater variety of nest materials than any bird that I know. Here is a list of them: grass in abundance; and in less quantity, moss, twigs, dead fern, dead herbage, ivy stems, rushes, wool, strips of bark,* roots, dead leaves, straw, string and feathers. Inside, the smooth, basin-like hollow is usually lined with rotten wood. The four eggs that usually make a clutch weigh together a trifle under one ounce, actually ·94 oz. Rarely much concealed, the nest, usually placed in a hedge, bush or low tree, may not infrequently be found on a rock ledge in cliff or quarry. I have seen one in a garden tool-shed. Another that I found in a spruce fir, was so badly placed that all but one of the callow young had fallen out and died. I cannot really say that of the several hundred nests that I have observed any one of them was actually on the ground; the only doubtful case was one found in a wood and this *may have* been placed there by wood cutters who, working near, had disturbed and placed it on the level for safety. Eighteen feet above ground in a tree is the greatest height at which I have found one built. The Song Thrush moves on the ground by hopping and running. Often one movement is alternated with the other.

The Redwing (*Turdus iliacus*). Locally called the felfer or small felfer. This bird is only known here as a winter visitor and just as the winter of 1906-7 was the severest that I have known here, so it was also our biggest redwing winter. Hundreds must have died in the town alone, and thousands in the immediate neighbourhood. They were in every garden and they haunted the harbour here and also at Bridlington, feeding

on the refuse of fishermens' bait. 'As weak as a winnel' (it's West Country local name) is an old Somerset saying, and the bird seems to lack the power of accommodating itself to circumstances and is quite unable to dig out snails from a snowed up hedgerow as the Song Thrush can. When the severe weather breaks, all the birds that have survived disappear, and I have never known them to remain later than March 19th.

The Fieldfare (*Turdus pilaris* L.). The 'felfer' and the 'blue-tail' of the natives sometimes turns up in autumn as early as September 20th, and sometimes remains in large or small chattering flocks until May 10th, when I once saw as many as a hundred together. They haunt the fields in scattered flocks or feed on berries in woods and hedges, but like the redwings they always seem to be aliens, and we never know them as we do our blackbirds and thrushes and that is why this is so short a paragraph.

*The Blackbird (*Turdus merula* L.). Resident and abundant throughout the year. In the autumn their numbers are greatly increased by immigration, the new arrivals haunting low bushes on the sea cliffs for some days before spreading inland. At such times cock birds seem to predominate. Here the blackbird does not commence its spring song so early as either the Song or Mistle-thrush. Only once have I heard it in January and that was on the thirty-first of the month. But in April, May and June, its rich voice is more noticeable than the throstles. The song is sung with many pauses and in the slowest of bird time. It may be heard in early summer from 2-15 a.m. till 9 p.m. It becomes silent by about July 13th.

The Blackbird's nest is usually placed low down in hedges, banks, bushes and on tree trunks, sometimes quite on the level, though occasionally as much as twenty-five feet above ground in a tree. Occasionally in cow-sheds, often on a heap of sticks and sometimes stuffed into a tree hole open to the sky. The materials used, most frequently grass, include also green and dead herbage, roots, moss, straw, twigs, strips of bark, fern, feathers, wool and paper, the nest walls being lined with mud. I have not found eggs in the nest before April 11th, nor after July 12th. Usually only four eggs are laid—63%, and in my experience never more than five—37%. Almost always characteristically speckled, on very rare occasions I have found all four eggs in a nest practically spotless. In weight they about equal those of the Song Thrush. One of the most abnormally large wild bird's eggs that I have seen is a blackbird's, now before me. Howard Saunders says: 'average measurements 1·1 by ·85 in. This egg, one of a clutch of five, measures 1·35 by 1 in., exactly equal to the above-named author's average measurements for a magpie's egg.

As fond of worms as the Thrush is of snails, it is no friend of the gardener in strawberry time. In autumn it may be seen feeding on rowan and other wild berries, but in severe weather it is not dainty and will pick undigested grain from horse-dung. That it hunts the ground very closely may be proved by my finding one caught in a game-keeper's trap set under stones for weazels, etc.

The blackbird's alarm note is very aggressive, *i.e.*, 'kick, kick, kick, kick,' or 'chuck it, chuck it, chuck it,' and often betrays the presence of an owl abroad in the daylight whilst at roosting time it makes more noise than all the other birds in the wood put together.

The Ring-Ousel (*Turdus torquatus* L.). Sparingly distributed over the wilder parts of the moors this is not a common bird, even in its favoured haunts here or indeed anywhere in Britain. Here it reaches the most easterly portion of its range, but is confined to the North Riding portion of our district. Its earliest recorded arrival in our neighbourhood is April 8th, and it has been known to remain until October 1st. The nest, like the Blackbird's, but *without the mud lining* and consequently less substantial, is usually placed in the bank of a stream or dry ditch well out on the open moors, although I have found it in a rowan tree 10 feet up.

I have not found more than 4 eggs in the nest which in this district has been known to contain young birds as early as May 6th. Although not in any sense gregerious in the breeding season I have found two pairs nesting within fifty yards of each other with four eggs in each nest.

The Wheatear (*Saxicola oenanthe* L.). Never arriving here before the twenty-first of March, it has not been known to remain later than October 16th. Nowhere abundant it is most noticeable about rabbit warrens, small and large, on sandy soil where it usually nests in the small or 'blind' burrows, but when the young are well fledged and quite able to fly they often retire into any of these dug-outs when alarmed. The nest is made of grass, roots, herbage-stems, wool, hair and feathers. The eggs which are the palest of pale blue, weigh from ·1 to ·12 oz. May 13th is the earliest date on which I have found them.

*The Whin-chat (*Pratincola rubetra* L.). Locally called the grass-chat, comes into summer residence in our district in varying numbers annually and remains with us from April 18th till September 19th. The song, somewhat like the robin's in style, but rather quicker, may be heard at midsummer from 3-12 a.m. till 8-45 p.m. After July it says nothing but 'U Tick,' very aggressively if you approach its now fledged young. It sings usually whilst perched on the top of a fence of hedge, but I have seen it singing on the top of a 40-foot ash tree. Its nest, composed of grass stems, herbage, hair and moss is not usually difficult to find on road-side banks, in meadows or on furze covered hill sides but never with eggs before May 28th. Usually six eggs are laid, varying much in the depth of their bright green ground colour; some being practically spotless and others well covered with markings. Six eggs is the usual number, each weighing about ·06 oz.

The Stone-chat (*Pratincola rubicola* L.). This bird is very scarce, of local distribution, and as likely to be seen in winter as in summer. Odd pairs nest occasionally on the Moors and more regularly on the cliffs between Filey and Speeton. One of the most difficult of bird's nests to find, those that I have examined have been composed of dead grass, moss, fine roots and hair.

*The Redstart (*Ruticilla phoenicurus* L.). Locally called the 'firetail,' a common, well distributed and very beautiful bird, to be seen from April 1st to September 20th in woods and about gardens throughout the district. It commences to sing on arrival and at Midsummer may be heard at 2-10 a.m., but it is silent except for its call note after June 24th. Nests with eggs may be found as early as May 7th, the materials used being moss, dead grass, leaves and feathers. Any hole of suitable size is adopted, in tree or wall, it may be close to the ground or 15 feet above it. This bird lays more eggs than any other bird of the family *turdinæ*, seven in a nest being quite a common number. Weighing from ·05 to ·07 oz., they are usually unicolorous pale blue, but, although this has been disputed, I know from personal experience that all the eggs in a full clutch are occasionally faintly but regularly spotted.

(*To be continued*).

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In *The Quarry* for July, Dr. J. Scott Haldane writes on 'The Effects of Dust Inhalation.'

In addition to the usual reviews of recent Progress in Science, *Science Progress* for July contains the following papers, among others: 'Some Aspects of Animal Colouration from the Point of View of Colour Vision,' by J. C. Mottram and F. W. Edridge Green; 'The Food Requirements of a "Normal" Working-Class Family,' by Sir Henry Thompson; and 'Science and Industry,' by Prof. R. A. Gregory.

DONCASTER NATURAL HISTORY NOTES FOR 1917.

The following is a summary of the records made in the Doncaster District by the members of the Doncaster Scientific Society, during 1917.

Birds.—There was a marked diminution in number in many species owing to the severe and prolonged winter of 1916-1917. All the Turdidæ, with perhaps the exception of the Missel Thrush, were greatly decreased. The summer migrants were few in number with the exception of the House Martins, these were more abundant than usual. Starlings were greatly reduced, but perhaps the most marked case was with the Winter Thrushes, Redwings and Fieldfares; the former were far from common, and the latter almost completely absent.

Conchology.—Mr. Moat has discovered an extraordinary abundance of the larger Helices near Blaxton. This is a district of peat, sand and gravel; the class of soil on which shelled molluscs are usually rare. But here they were found literally in thousands. The species included *Arianta arbustorum*, abundant, fine and varied, including one specimen of a pale colour intermediate between v. *flavescens* and v. *albina*; *Helix aspersa*, fine, but not much varied; *Cepæa nemoralis* in great profusion, their colour and banding is much varied and some are of a remarkably large size; among them is a very fine specimen of v. *conica*; *C. hortensis*, also in abundance and great variety, the v. *lutea* without bands being the commonest; *Theba cantiana*, very abundant. Four species have been found in the district that are new to our local lists, namely, *Hygromia granulata* at Wadworth, *Jaminia muscorum* at Little Smeaton, *Segmentina nitida* at Askern, and *Vivipara contecta* near Blaxton and Bentley.

Lepidoptera.—The most interesting facts noted were the great abundance of many species usually rare or absent here. Among these *Vanessa io*, *Sphinx convolvuli* and *Pygæra bucephala* were specially abundant. Other species taken include *Argynnis cydippe* at Martin Beck, *Satyrus ægeria* at Brock-o-dale, *S. hyperantus* at Martin Beck, *Manduca atropos* at Doncaster, *Chærocampa elpenor* (larvæ) feeding on *Goodetia* at Doncaster, *Zeuzera pyrini* at Doncaster, *Amphydasis strataria* in Wheatley and Wadworth Woods, *Cymatophora duplaris*, *Stigmonota nitidana* and *Choreutes scintillunana*, all at Martin Beck.

Coleoptera.—The following species among others have been taken:—*Ips 4-guttata* in Wheatley Wood, new to v.c. 63; *Cryptocephalus pusillus* at Martin Beck, new to Yorkshire; *Tacyphloeus olivieri* and *Orthochætes setiger* at Little Smeaton, both new to v.c. 63; and *Malthinus frontalis*, new to v.c. 63, at Martin Beck.

Hymenoptera.—The following species have been collected, all of them new to the county list:—*Tenthredopsis inornata*, Martin Beck; *Tenthredella colon*, Wheatley Wood; *Pteronus oligospitus*, Rossington; *Rhodogaster viridis*, Martin Beck and Edlington Wood; *Bethylus cephalotes*, Little Smeaton; and *Ichneumon gracilentus*, Wheatley Wood.

Odonata.—*Sympetrum striolatum*, West Moor; *Libellula 4-maculata*, Martin Beck; *Aeschna juncea*, Doncaster; and *Lestes sponsa*, Martin Beck.

Hemiptera.—Among those that have been diagnosed are *Acanthosoma dentatum*, Wheatley Wood; *A. interstinctum*, Martin Beck and Wheatley Wood; *Scoloposthetus affinis*, Wheatley Wood; *Lopus gothicus*, Martin Beck; *Phytocoris longipennis* and *Ph. pini*, Wheatley Wood; *Ph. populi*, *Cyllocoris histrionicus*, *Mecomma ambulans* and *Psallus betuleti*, Martin Beck; *Ps. ambiguus* and *Ps. falleni*, Wheatley Wood.

Microscopy.—Special attention has been paid to the Diatoms of Martin Beck. So far 106 spp. and vars. have been found, 23 of which are not included in 'West's Alga Flora of Yorkshire,' and 40 have not been recorded for v.c. 63. No fewer than 37 sp. and vars. of the genus *Navicula* were found, of which the more notable were *Navicula americana*, a very rare diatom, new to Yorkshire if not to England. The two specimens

found differ very slightly from the type form, described and figured by Van Heurck, the margin of the valves being parallel, instead of having a median constriction. In other details they are true to the type, though somewhat shorter. *Navicula alpina*, the only diatom in West's book endorsed *rare*. As its specific name implies it is usually found at a much greater altitude than Martin Beck, which is only about 100 ft. above sea-level. *Navicula* (sp. nov.); this is not given in Van Heurck's Diatomaceæ, nor in Clue's Nat. Diat. It is, however, in Schmidt's Atlas 43/24, without a name, although the stauras (central vacant space) is there shown slightly more distinctly than in Mr. M. H. Stiles' photograph of it. This species will shortly be described in *The Naturalist*. *Navicula pusilla*, a very beautiful diatom not previously recorded for v.c. 63. Only specimen was met with—a complete frustule, the upper valve of which one is slightly broken, though the lower is perfect. The genus *Eunotia* is represented by 15 spp., next to *Navicula* the most numerous.

H. H. CORBETT, *Hon. Sec.*

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Tommy Smith at the Zoo, by **Edmund Selous.** London: Methuen & Co., 183 pp., price 2/3 net. This book is by our contributor, who is the author of 'Tommy Smith's Animals' and 'Tommy Smith's Other Animals,' each of which has been published in several editions. It is written in a happy conversational style, and deals with the lion, bear, boar, kangaroo, elephant, orang-outang, penguin and ostrich. It is well illustrated, and the book is likely to be as popular as its predecessors.

Glossary and Notes on Vertebrate Palaeontology,* by **S. A. Pelly.** London: Methuen & Co., 113 pp., 5/- net. During frequent visits to the Natural History Museum, South Kensington, the author made notes on the names of the various vertebrate remains there exhibited; these he extended by the aid of well-known text books, and the present volume is the result. It contains about 700 scientific names of vertebrates, with details of their origin and notes on the species described, and their geological history. The notes have apparently been carefully compiled and will doubtless be of great service to the visitors to the Natural History Museum, to whom the names attached to the fossils are often anything but intelligible. The glossary will also prove valuable to the student of geology. So far as we have tested the glossary we have found it quite good and reliable.

The Herring: its Effect on the History of Britain, by **Arthur Michael Samuel.** London: John Murray, 200 pp., 10/6 net. We learn from the publisher's announcement that 'This is not a Natural History book, or a treatise on the Herring trade. It tells the story of an ancient industry over a period of a thousand years. In the early Middle Ages the Herring created the wealth of the Hansa League, and, later, of the Dutch; it was for centuries the pivot of trade in Northern Europe. Out of the Dutch Herring Fishing Fleet grew their mercantile marine, to be superseded by ours in and after Cromwell's days. This was followed by the development of the British Colonial Empire and the expansion of our sea-carrying trade. The book deals with the 17th Century disputes around the Herring Fishery and the Dominion of the Seas, and endeavours to throw light on what Germany means by the phrase "The Freedom of the Seas." It contains a number of curious and forgotten recipes for cooking the Herring.' The author, at one time Lord Mayor of Norwich, has done his work thoroughly, and makes an interesting contribution to British economical history. The volume is well illustrated by reproductions of medals and old prints, and there is a good Bibliography. There is naturally a strong Norwich flavour to the work.

* 'Paleontology' on the wrapper.

YORKSHIRE NATURALISTS AT MARKET WEIGHTON.

QUITE a representative gathering of members of the Union assembled at Market Weighton on Saturday, 15th June. Owing to the restricted train service the time at the visitors' disposal was curtailed and only a limited area was traversed. Under the guidance of Mr. J. F. Robinson the botanical party proceeded to the old Canal and spent their time in an examination of the flora of a portion of this disused waterway, the return journey being made over the cultivated Common. The geologists, led by Mr. J. W. Stather, explored the Goodmanham Valley, and walked over the Wolds to Arras and Hesslekew, returning by the Beverley Road. At the meeting held at the close of the Excursion, Mr. Thomas Sheppard, M.Sc., presiding, thanks were accorded to Mr. Stather for making the local arrangements. It was also resolved that a vote of condolence be sent to Dr. H. H. Corbett in the loss he had sustained by the death of Mrs. Corbett. W.E.L.W.

CONCHOLOGY.—Mr. J. A. Hargreaves reports that he obtained the following species from the old Canal, viz., *Limnæa peregra*, *Planorbis carinatus*, *P. fontanus*, *P. vortex*, *P. albus*, *Physa fontinalis*, *Bithynia tentaculata*, *Valvata piscinalis* and *Sphærium corneum*.

Mr. Greevz Fysher reported that various localities had been examined. In the stagnant end of the Canal on the Selby road were found several *Limnæa auricularia* var. *acuta*, *L. peregra*, one *Physa fontinalis*, a few *Planorbis carinatus*, one *Pl. spirorbis* var. *rotundata*, one *Valvata piscinalis*, *Bithynia tentaculata* and *Sphærium corneum*—and a caddis-case was covered with *V. piscinalis* and *Planorbis fontanus*. In the stream which feeds the Canal near the Reformatory were *L. peregra*, *Ancylus fluviatilis*, and on a caddis-case numerous *Planorbis crista* and one *Pyramidula rotundata*. In the same neighbourhood were found a few *Zua lubrica*, small examples of *Hyalinia nitidula*, and one *Hygromia rufescens*. In the Goodmanham valley, mostly from nettle-beds, were collected *Helix nemoralis* (dead), *H. hortensis* var. *lutea* 12345 and 00000 (one each), a few *Helicella virgata* (three), *H. caperata* (a few), a few *Hygromia hispida* var. *rubens*, *Hyalinia cellaria* (a few), *H. nitidula* (a few), one *Zua lubrica* and several *Limnæa peregra*.

FLOWERING PLANTS.—Mr. J. F. Robinson writes :—Although brilliant sunshine for the most part, tempered by fairly strong breezes from the west, favoured the meeting, three or four hours were all too short a time to do justice even to the small circuit made by the botanical contingent. From the rendezvous a walk towards Holme-on-Spalding Moor took us to Canal Head, thence to the first old lock and River Head ; after which, the bank of the chalk-gravel beck across Market Weighton Common brought us back to the starting place. Wild roses (all *canina*) and elder blossoms made the high road not an unpleasant path between great fields of rye, just now on the ear ; and of carrot and of peas in blossom, as well as, of course, a huge cultivation of wheat and other cereals. It was observed on the occasion of our visit that the ' great sand-field ' required much rain.

The bit of old Canal from the Head to the first lock is now very shallow and almost dried up in places. Much overgrown, too, is it by jungles of the reeds *Phragmites* and *Poa aquatica*. In the shallow water there was abundance of the water crowfoot *Ranunculus circinatus*, flowering profusely, and also submerged species of duckweed (notably *Lemna trisulca*) and an evil-smelling cryptogam—*Chara fragilis* (? sp.).

Myosotis cæspitosa seemed to be commoner in the wet places than *M. palustris*, the true forget-me-not. Gipsywort (*Lycopus*) and *Rumex Hydrolapathum*, the tallest of our docks, with its fine upright, lanceolate leaves invested with a bluish bloom, were also in evidence ; the latter very much so. *Orchis latifolia* was common.

Perhaps nothing very rare was found along the length of the chalk-

gravel stream that intersects Market Weighton Common and finally fills the Canal, but vegetation was lush and varied, and intensely interesting. So also proved the investigation of the wild denizens of a blossoming pea field through which lay our pathway.

If the list of species formerly recorded by Mr. J. J. Marshall was scarcely verified, that must be put down to the limited circuit made, and to the high state of cultivation of the land. But it was a delightful and profitable ramble for all that.

Mosses and Hepatics.—Mr. C. A. Cheetham writes:—Mr. J. J. Marshall's work at the mosses of this district was rewarded by many interesting species, but without his leadership it was unlikely that all could be seen, a previous excursion with him had, however, given an insight and a good list results.

The most interesting ground was in the woodland. Amongst the heather were two species of fork-mosses, *Dicranum spurium* Hed. and *D. undulatum* Ehr., the latter being known nowhere else in the county; the most frequent mosses were *Dicranum scoparium* Hed., *Hypnum Schreberi* Willd. and *H. parietinum* Lindb. in the heathery places, *Hylocomium squarrosum* Br. Sch. amongst grass, and *Dicranella heteromalla* Schp. and *Webera nutans* Hed. (*Pohlia nutans* Lindb.) on the sides of ditches; with these latter were two hepatics, *Alicularia scalaris* Corda. and *Cephalozia bicuspidata* Dum. A more uncommon hepatic, *Ptlidium ciliare* Hampe, was growing with the fork-mosses. *Aulacomnium androgynum* Schw. (*Orthopyxis androgyna* P. Beauv.) was seen on old tree stumps, and *Webera carnea* Schimp. (*Pohlia carnea* Lindb.) on the sides of the stream. A walk up the railway bank by Goodmanham gave some poor but recognisable gatherings of the two seligerias, *S. calcarea* B. and S. and *S. paucifolia* Carr., which grow on the blocks of chalk used in constructing the line.

Geology.—Mr. T. Sheppard reports that the geologists first visited the well-known section near the rifle-butts on the railway-line side, in the Goodmanham valley, where the feather-edges of various beds rest against the Market Weighton articline, so well described years ago by John Phillips. In the target-pits traces of the Lower Lias beds could be detected. A few feet above was the Red Chalk, yielding *Terebratula biplicata* and *Belemnites minimus*. The beds here also contained a quantity of very ferruginous nodules, reminding one of the Carstone of Lincolnshire. There was also a good section in the Lower or Grey Chalk. The party then crossed over the Wolds, where many excellent views of dry chalk-valley formation were seen, and on the hill near Goodmanham Church were the large earthen mounds said by some authorities to represent the site of the heathen temple where the idols of wood were profaned, as described in Bede's 'Ecclesiastical History.' A visit was next paid to a farm house where was said to have been an ancient temple, but all the party could discover was a carved head from some fourteenth century church, built into a wall, and the occupant knew no more of a 'temple' than the visitors found. A visit was then paid to a small circular depression at Hessleskew, now almost hidden by trees, which for generations of 'historians' and writers has been described as a 'Roman amphitheatre.' A careful examination, aided by numerous rabbit burrows, showed that there was no justification for the 'Roman amphitheatre' theory—in fact the depression was far too small and in all probability is one of the numerous circular pits sunk in various parts of the Wolds for the purpose of obtaining chalk. The hill-top on the opposite side of the road was then examined in order to investigate a 'Roman camp.' From this field—almost bare as a result of the ravages of the turnip-fly (though the farmer had wisely sown turnips and mangolds together, and as the fly doesn't eat the latter he still had a crop)—large quantities of stone, some 'worked,' had been removed. The party was told of a large square 'Roman camp' on the hill-top—certainly a good site—and this was carefully examined under favourable conditions.

There were certainly traces of a large quadrangular enclosure, from the remaining ridges of which about 20 tons of stone had been removed to the adjoining farm-yard. An examination of these showed that they were mainly of Millepore Oolite, some of which had clearly been dressed. The field was also well strewn with ' Roman tiles,' and these proved to be roof tiles of probably sixteenth century date. Towards the centre of the ' camp ' was a deep well, protected by brushwood. The farmer informed us that this was 111 yards deep, and that the well was lined with dressed stones. The only coins known to have been found on the site were two silver sixpences issued at York by Cattle & Barber in 1811. A careful review of the evidence, therefore, seemed to point to the fact that a farmstead occupied this site in the sixteenth century, and that, like the ' amphitheatre ' close by, the evidence of Roman date was not forthcoming. Thus the long-cherished evidences of Roman occupation in this district vanished. An adjoining field had years ago yielded the remains of a chariot burial—and other interesting relics of the Early Iron Age—now in the York Museum. The party ' dropped ' into Market Weighton, the said ' drop ' being a little jaunt of about six miles ; consequently the geologists are hardly able to quite agree with the reference to the ' limited area ' referred to at the beginning of this report by our more youthful and energetic secretary.

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Mutilia europæa.—A specimen of the Solitary Ant found during the latter part of May at Keys beck, Goathland, and now in the collection of Mr. I. L. Rowland, appears to have only recently emerged from the pupa state. The captor suggests that the insect emitted a low buzzing when first handled, if this is characteristic of the Mutillidæ, it shows, considering their habits, a species of camouflage rather remarkable ! The following is a description of this specimen :—*Thorax*, both above and below dull red, shiney ; *Legs*, black, covered with short bristles ; *Eyes*, large and black ; *Antennæ*, thick at base, tapering, slate colour ; *Abdomen*, black and heavy, having a narrow gold band near the junction with the thorax and two other bands near the extremity ; the latter are broken above and appear as a double row of gold spots with their convex side towards the head ; below, all three bands are continuous as narrow gold lines. Length, 11 to 12 mm. Two more specimens were taken on June 22nd on the Moor near the head waters of the River Derwent. One of these is in the possession of the writer and is much smaller than the insect above described, the single band does not appear below the abdomen, its colour and that of the spots is silvery rather than golden, the spots apparently having parallel edges ; as the abdomen is almost denuded of hair it has possibly suffered from wear and tear during its short life. There is a patch of yellow pollen on one side of the thorax near the base of the legs. A fourth specimen was found by me many years ago near this latter locality. Further information as to the appearance of this insect on our local moors may be found in Frank Elgee's ' Moorlands of North East Yorkshire,' page 268.—Joseph T. Sewell, Whitby.

FIELD NOTES.

BIRDS.

Food of the Tawny Owl.—Mr. Butterfield in his letter in *The Naturalist* for July, remarks that " It used to be thought that owls would not eat the Common Shrew.' Far from this being the case I believe the Barn Owl takes more shrews than anything else. I found in 28 castings picked at random from beneath the roosting place of one of these owls the remains of no fewer than 44 common shrews, and 2 pigmy shrews. In addition there were the bones of 18 common mice, 7 young brown rats, 9 field mice (*M. sylvaticus*) 27 field voles, 5 Bank Voles, and 2 small birds, of the latter the exact identity was doubtful. I have also noticed that a tame Tawny Owl ate shrews with relish, bolting them whole like mice. It certainly liked them and had no antipathy to them such as is exhibited by cats and dogs.—(Miss) Frances Pitt, Bridgnorth.

Goldcrests (*Regulus regulus*) in the Lake District.—Many birds suffered during the terrible winter of 1916-17, and the Goldcrest was hit so hard that in many parts of the country it was extirpated. Here in North-west Hertfordshire, where prior to 1917 it was a common resident, I have neither seen nor heard one for eighteen months, and I sought in vain for the bird in many of its haunts in Carnarvon, Denbigh and Merioneth in the summer of that year. It was therefore with very lively pleasure that I heard about half-a-dozen singing in mid-June this year in the woods of Patterdale and the lower part of Grisedale, and a like number a week later about Rosthwaite in Borrowdale. That some Goldcrests survive in these sheltered valleys is good augury for their ultimate re-occupation of bleaker regions.—Chas. Oldham, Berkhamsted, Herts.

Greater Spotted Woodpecker (*Dryobates major*) in Westmorland.—The Greater Spotted Woodpecker is perhaps sufficiently rare in Westmorland to justify a note of its occurrence during the nesting season. I came across a pair in Naddle Forest, close to the shore of Haweswater, on June 13th, my attention being attracted to the birds by their loud, staccato notes of alarm, *tcheck, tcheck.* Time pressed, and I was unable to locate the nest-hole, but the behaviour of the birds left no doubt in my mind that they were interested in a brood. Many of the trees about the spot bore evidence of the birds' search for insects, and I noticed many hazel nuts which had been wedged into crevices and hacked open, Nuthatch-fashion, a habit perhaps more common than is generally supposed. Not only are hazel nuts treated in this way, but, as I noticed twenty years ago, when living at Alderly Edge in Cheshire, oak-apple galls were sometimes wedged into crevices of tree trunks for convenience in hacking out the contained larvæ.—Chas. Oldham, Berkhamsted, Herts.

ENTOMOLOGY.

***Cucullia verbasci* at Huddersfield.** — On July 8th, I collected from a large cultivated *Verbascum* plant, in my neighbour, Mr. Whiteley Tolson's garden, about two dozen full-fed larvæ of *Cucullia verbasci*. On another large plant, in a different part of the garden, and at a fair distance from the first, was another considerable brood of the same species, but in that case the larvæ were only about half grown, some even much smaller than that, so that there must have been at least two female moths in the garden this year. The species has never been recorded from this district before, so far as I know, and it is scarcely likely that so conspicuous and striking a larva feeding exposed and almost gregariously, could have been missed had it been here. The species is common enough in some parts of the county.—Geo. T. Porritt, Elm Lea, Dalton, Huddersfield, July 15th, 1918.

***Euthemonia russula* near Skipton.**—On the first of July last I took a specimen of *Euthemonia russula* at the foot of Embsay Crag near Skipton, which was a male flying lazily in the sunshine by the side of the boundary wall of the moor. I believe this insect has not previously been recorded for North West Yorks. I also took two specimens of *Scoparia atomalis* on the 3rd on Blackhills, near Wilsden, which is not included in the list of Yorkshire Lepidoptera by Mr. Porritt, 2nd edition, published in 1904. In most years it is quite common—in some years abundant—in this locality, and it may have been overlooked in many other localities in Yorkshire. Hitherto, or up to recently, it has been considered a Scotch insect only.—E. P. Butterfield.

Scoparia atomalis has for a very long time been regarded as a small dark variety of the common *S. ambigualis*. We have for many years known it as common in South-west Yorkshire, and are much surprised to find no allusion to the form in the 'Yorkshire List,' as there ought to have been.—G.T.P.

***Corethra pallida*, etc., in Yorkshire.**—Whilst unsuccessfully searching for Anopheline mosquitoes on Austwick Moss during June and July, I saw some pale coloured gnats which on examination turn out to be *Corethra pallida* F., the most uncommon of the genus and easily identified by the brown dots on the legs; they were in fair numbers but confined to definite pools and had a weaker flight than the Chironomus species, their pale wings in movement giving an impression of a narrow isosceles triangular shape. I also got *Corethra plumicornis* F., and at the same time the curious daddy-long-legs *Dolichopeza sylvicola* Curt. (*Chirothecata* Scop.), most difficult to see, save for the long white tarsi. This Mr. A. R. Sanderson first showed to me at Austwick and we also found it in Ravensgill, Pateley Bridge; he has also taken Corethra larvæ many times from the Austwick Moss pools but the perfect insect does not

appear to have been identified. None of the above are in the list of Yorkshire diptera in the Victoria County History, nor does Wingate include them in his list of Durham diptera; the last two are given in Cooke's list of Cheshire and South Lancs. diptera in *The Naturalist*, 1880. I have spare specimens of *C. pallida* if any one would care to have them.—CHRIS. A. CHEETHAM, Farnley, Leeds.

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The Pairing of the Genus Hepialus.—The interesting observation of Mr. Morley on p. 234 of the current volume of *The Naturalist* and Mr. Porritt's comment thereon, lead me to hope that my views on the subject of Hepialid pairing may be of interest, if not of much value. I have always been interested in the alleged unmaidenly conduct of the females of *H. humuli* and *H. hectus*. Collecting recently in a wood where the latter species is unusually common (and unusually variable), I have tried to get an accurate view of what takes place when the insect is making love. I have seen the complete series of events twice only, but on each occasion affairs were conducted in the same way. We start with a row of *hectus* ♂ along the edge of the path, flying over the bracken in their characteristic way. Each one flies in an irregular, curved orbit of very small extent and the orbits of two insects rarely cross. If undisturbed a male *hectus* will fly for a long time without moving a yard from the spot where he first settled into his evening flight. After a time the female appears. She is not very visible in the growing dusk and I am not at all certain where she comes from. My impression, however, is that she rises from the bracken under the male. In neither of the cases observed did she appear to arrive from the outside world, nor did she when over sighted pay any attention to any male but the nearest. When once on the scene, she flies in an orbit like that of the male, her orbit mingling with his. The male flight becomes at once more jerky and agitated. They fly together thus for several minutes, jostling each other once or twice, though this appears to be due to the nature of their flight and not to the intention of either of them. A few minutes after the female's first appearance she settles rather abruptly on the under side of a bracken frond. The male almost instantly flies to her. Copulation takes place at once and the male hangs head downwards, his entire weight supported by the combined genital organs. While all this is going on there are several other males flying within a few feet, who take not the least notice of the proceedings. It seems to me that the female does not so much seek the male as accost the first one she comes across. Where the species is common he does not require much seeking. Although the males are apparently in great numerical superiority, she seems to have no attraction except for the one to whom she

has made the first advances. A detail that I cannot explain is that females taken in cop. are nearly always very wasted. Possibly they are on the wing for some time before copulation takes place, though this is not the custom with most moths. In my experience one never sees the female except in cop. or during the preliminary overtures. Perhaps she pairs more than once and between times flies out of sight among the bracken, while depositing the fertilized ova. Thus she would come to subsequent pairings with damaged wings. I have observed the pairing of no other species of *Hepialus* except *H. lupulinus*, the males of which seek the females in the normal way, as described by Mr. Morley. Judging from character of flight alone, I should say that *H. sylvinus* and *H. fusco-nebulosa* follow the example of *lupulinus*; *H. humuli* that of *hectus*.—H. Douglas Smart, Major, R.A.M.C.

—: o :—

AMPHIBIANS.

Palmated Newt (*Molge palmata*) in Westmorland —Little seems to be known of the distribution of this Newt in the Lake District, and it may be well to record its occurrence in Patterdale. It was abundant last June in a shallow reservoir choked with *Myriophyllum* on the wooded hill behind Patterdale Hall.—Chas. Oldham, Berkhamsted, Herts.

—: o :—

FUNGI.

***Polyporus Rostkovii* in S.E. Yorks.**—I have just received from Mr. John Foxton, Benningholme Hall, Hull, a fine specimen of *Polyporus Rostkovii*, 12 ins. high and 10 ins. diam. across top of pileus, this plant differs from *P. squamosus* in having a central stem. The pileus usually infundibuliform, thin and smooth (*i.e.*, not covered with scales), larger spores ($16\mu \times 5\mu$) and the stem abruptly black. The spores measured 14-15$\mu \times 5\mu$, but as Mr. A. D. Cotton of Kew has recently pointed out, the later shed spores in the basidiomycetes are slightly smaller than the earlier ones, and this should be borne in mind when spore measurement is a deciding factor. The spores of *P. squamosus* measure 11-12$\mu \times 5\mu$. I do not think *P. Rostkovii* has been previously recorded for vice-county S.E.—W. N. Cheesman.

——: o :——

The Fisheries of the North Sea, by **Neal Green.** London: Methuen & Co., 178 pp., 4/6 net. The publishers say: 'This little book is important on account of the increasing value and potentialities of the fishing industry in the North Sea. The author also describes the fisheries of Great Britain, Scandinavia, Germany, France, Russia and America." The author is practical and has made good use of the work of Sir John Murray, the Reports of the Fishery Board of Scotland, the French work on Fisheries by M. Herubel, and James Johnstone's Marine Biological Investigations. There is an interesting chapter on 'The Migration of Fish,' and an excellent map.

CORRESPONDENCE.

SAME CUCKOO TWICE MAKING USE OF SAME NEST.

I AM sorry that Mr. Butterfield considers my assertion too sweeping. I have been collecting cuckoos' eggs for over fifty years and have examined 772 sets (a fair number having two eggs of cuckoo in same set), and in no instance where there were two eggs had the eggs been laid by the same bird, nor had I ever heard of a case until the one mentioned by Mr. Butterfield. I have many series of clutches of the same variety, each containing a cuckoo's egg, obviously laid by the same bird, and taken at short intervals within a small radius, and it strikes one as singular why the cuckoo should trouble to find six, seven, or eight separate nests, when she could easily return to one that she had already adopted. I take it that instinct tells her there would be no room for two young in the same nest. The most interesting series I have is that of four nests of Garden Warbler—two nests containing two eggs each of cuckoo, and two one egg each, the product of two birds; No. 1 nest one small egg, No. 2 nest one small egg and one large egg, No. 3 nest one small egg and one large egg, and No. 4 nest one large egg, three eggs of each. I should be glad if Mr. Butterfield would give us the weight of the two eggs he mentions.

HERBERT MASSEY, Ivy Lea, Burnage, Didsbury, June 21st, 1918.

——o——

THE LATE G. KNOTT.

I REGRET to have to record the death of Mr. G. Knott, of Heckmondwike, on March 14th. Mr. Knott has left a valuable collection of Palæobotanical structure blocks and microscopic sections. These have been handed over to me for investigation and disposal in order to provide some funds for his widow, who is left in rather straightened circumstances. I have opened a fund, with the approval and assistance of Dr. Scott, F.R.S., and several other friends, to meet the case. The collection he has left has taken many years to get together and is of great value to science, embodying some of the rarest and most valuable structure plants known. Mr. Knott discovered *Sigillaria elegans*. This was followed by *S. mamillaris* and *S. scutellata*, all figured and described by Dr. Kidston, F.R.S. Later still he discovered a second example of *S. elegans*—this the finest example of a structural sigillaria yet known to science, is as yet uninvestigated. It shows a complete cylinder of outer cortex with the characteristic leaf bases—*portions of inner cortex* crowded with outgoing leaf and cone traces, and in the centre the beautiful arrangement of primary and secondary zylem zones, the cells themselves throughout being in a unique state of perfection, hitting off the specific name ' elegans ' divinely. Mr. Knott got no pecuniary assistance during his life, and as his valuable work has been placed at the service of science, I beg to appeal to interested friends for financial aid for his widow. Contributions should be sent to my address and made payable to me for the Mrs. Knott Fund.

W. HEMINGWAY, 1 Seale Street, Chester Green, Derby.

——: o :——

An illustrated article on Rat-Trapping appears in *The Journal of the Board of Agriculture* for March.

Report No. 66 of the Marlborough College Natural History Society contains 56 numbered (mostly wrongly) pages, and 28 un-numbered. The society has had a successful year and we must say the notes and observations have been carefully and thoroughly drawn up. They appear under various headings; attention is drawn to remarkable and unusual occurrences and note made of additions to the local lists. Besides the usual headings we notice the Diptera are dealt with and there are meteorological and anthropometrical reports.

NEWS FROM THE MAGAZINES, etc.

Nature for June 6th contains notes on 'The Position of Natural Science in the Educational System of Great Britain.'

Dr. J. S. Flett, F.R.S., and Capt. P. Chalmers Mitchell, F.R.S., have been elected Officers of the British Empire, for service in France.

The Scottish Naturalist for June contains a paper on the 'Occurrence of a Giant Squid (*Architeuthis*) on the Scottish Coast,' by James Ritchie.

Under the head of 'Gleanings from my Note-book,' Dr. J. W. H. Harrison describes many northern county records in *The Entomologist* for July.

The collections formed by the late George J. Hinde have been presented to the Geological Department of the British Museum (Natural History) by the family.

Now that *The Zoologist* is dead, we are prepared to place our pages at the disposal of writers of short notes on Mammals, Fishes and Reptiles of this country.

We should like to congratulate Mr. Albert Gilligan, the Secretary of the *Yorkshire Geological Society*, on receiving the D.Sc. Degree of the Leeds University.

Our contributor, Mr. A. E. Trueman, has received the D.Sc. degree of the University of London for a thesis entitled 'The Evolution of the *Liparoceratidæ*,' and other papers.

An excellent account of the 'Cowling Ramble' held jointly with the *Yorkshire Naturalists' Union*, has been prepared by Mr. J. Bradley, for the benefit of the Haworth Ramblers.

We regret to notice the announcement of the death of Dr. E. A. Newell Arber, at the age of 47. He was an authority on Fossil Plants, and the author of a number of books and papers on the subject.

We notice that Civil List pensions have been granted to the Widows of the late Prof. J. W. Judd, R. F. H. Rippon, Dr. Arthur Vaughan and George Coffey, and also to the daughter of the late Dr. Jonathan Couch.

Mr. Claude Morley gives some 'Awkward Incidents in an Entomological Career' in *The Entomologist* for July. His notes include a record of the fact that he once rolled upon three 'hard-boiled' eggs which were in his pocket, but which proved not to be 'hard-boiled.'

We learn from *Nature* that some human bones found on an alleged ancient level, near Ipswich, by Mr. J. Reid Moir, are pronounced by Prof. Keith to be 'essentailly identical with those of modern man.' Judging from the results of some of Mr. Moir's previous researches we can believe this is quite possible.

The Report of the Yorkshire Philosophical Society for 1917, recently to hand, shows steady progress in the various branches of the Society's work. It includes a report of the Field Naturalists' section, Meteorological notes, additions of the Museum and Library, and an article on 'John Browne, the Historian of York Minster,' by George Benson.

In *The Entomologist's Monthly Magazine* for July, Mr. P. H. Grimshaw records '*Chortophila pilipyga* Villeneuve' for Nottinghamshire, and Mr. R. S. Bagnall records '*Campodea meinerti* sp. n.' at Manchester, Durham, etc., and '*C. wallacei* sp. n.' from Heaton, near Newcastle. In the same journal, Mr. G. B. Walsh records '*Silpha nigrita* Creutz. in Co. Durham.'

The British Musem (Natural History) has just issued '*A map showing the known Distribution in England and Wales of the Anopheline Mosquitoes*, with explanatory text and notes by William Dickson Lang, M.A.' (63 pp., 2s. 6d.). The distribution of *A. maculipennis*, *A. bifurcatus* and *A. plumbeus* are indicated, but judging from the localities given we should assume that the map more really represents the areas in which naturalists have collected anophelines than the actual distribution of the species. Most of the Yorkshire records are centred round the Filey district, whereas large areas in other parts of the shire, as well as in other northern counties, seem to be without any records at all.

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We always have enemies within our garden-gates, and would-be gardeners are often reminded that the results of their labours may be brought to nought or greatly lessened by the work of destructive insects. There are other insects, however, that are our Allies, as they live on the destructive pests and thus help to protect the vegetables and fruit. It is, therefore, most necessary to be able to distinguish between useful and destructive insects, hence the popularity of Browns' "Enemies of the Garden," as the charts show at a glance how to tell our enemies from our friends. A set of the illustrations should be exhibited in all our schools or village clubs, as the knowledge which they and their accompanying handbook convey is essential to successful gardening. The small expenditure on same will prove a truly profitable investment.

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August 1st, 1918.

SEPT. 1918. No. 740
(No. 514 of current series.)

THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY
T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
THE MUSEUMS, HULL;
AND
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TECHNICAL COLLEGE, HUDDERSFIELD;
WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
J. GILBERT BAKER, F.R.S. F.L.S., GEO. T. PORRITT, F.L.S., F.E.S.,
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NOTES AND COMMENTS.

SCIENCE AND THE WAR.

'If there be one lesson more than another which the war is going to teach us, it is the lesson as to the future place of Natural Science in our education. It is true that there are still military authorities coming forward to say that we do not want science in the education of officers. But the military authorities have exhausted their power of surprising us; and, after all, some rational voices are beginning to be heard even in military circles. Science is coming to be recognised as part of the necessary equipment for modern life. The world is more and more coming to turn on exact knowledge, and science is simply exact knowledge applied to concrete things. As Bacon said, we can only command Nature by obeying her laws. These laws are the rules of the universe in which we live.'

NATURAL SCIENCE AND EDUCATION.

The above paragraph may be taken as the key-note of a little volume entitled 'Natural Science and the Classical System of Education: Essays New and Old,' edited for the Committee on the Neglect of Science by Sir Ray Lankester.* Its appearance is most opportune; we only wish it were possible for some superhuman to make every Member of Parliament read it. There are nine essays, some old, some new, but all good, by A. L. Smith, C. S. Parker, E. E. Bowen, Lord Houghton, W. Johnson, H. G. Wells, F. W. Sanderson, and the Editor.

PRODUCTS OF YORKSHIRE COALS.

In the recently issued *Journal of the Institution of Petroleum Technologists* are given the following examples of the products obtained from Yorkshire coals, carbonised at low temperatures:

Yorkshire Coal (washed smalls).

17.5 gallons of crude oil per ton of coal carbonised was obtained.
Yield of sulphate of ammonia—22 lb.
The oil yielded, on fractionation:

Oil distilling up to 150° C....	3.0 gallons.
Fuel-oil	11.0 ,,
Paraffin wax	8 lb.

Yorkshire Cannel.

Yield of crude oil—70 gallons per ton of coal carbonised.
Yield of sulphate of ammonia—3.2 lb.
The oil yielded, on fractionation:

Oil distilling to 170° C.	7.4 gallons.
Fuel-oil	49.3 ,,

The first fraction was taken up to 170°, instead of 150°, for a special purpose. There was only a small portion of paraffin wax, which was not estimated.

* London: W. Heinemann. 268 pp., price 2/6 net.

SLACK FROM BITUMINOUS YORKSHIRE COAL.

Yield of crude oil—24 gallons per ton of coal carbonised.
Yield of sulphate of ammonia—22 lb.
The oil on fractionation yielded :

Oil distilling to 170° C.	2.8 gallons
Fuel-oil	12.0 ,,
Paraffin wax	not determined.

A RIVER OF THE COAL AGE.

During the winter, Professor P. F. Kendall, in a lecture to the Leeds Philosophical Society on ' Rivers of the Coal Age.' described the courses of some of the streams fertilising the great deltaic plain on which were accumulated the materials of the coal seams of the Yorkshire coalfield. Recently the members of the Yorkshire Geological Society had an opportunity under Professor Kendall's guidance, of visiting and examining the traces of some of these streams in the workings of the Ackton Hall Colliery, Featherstone. When the shaft of the pit was originally sunk, 24 years ago, the important Silkstone seam (as that which is elsewhere called the Middleton Main seam is locally called) was passed through without recognition. It was subsequently found that the shaft was situated in an area in which the coal had been seriously thinned by stream action of Coal Measure times. With the development of the workings it has been shown that throughout the length of the Actkon Hall estate—about three miles—there is a tract of a quarter of a mile wide, evidently the bed of a stream, where the Silkstone seam is altogether removed, and its place filled with a valueless sandstones and mudstones. Besides the great ' wash-out ' (which was no doubt the effect of a river of a phase a little later than the deposition of the seam), relics were examined of a river which was strictly contemporary with the seam itself. This smaller river is marked, not by the total removal of the coal, but by the intercalation in the midst of the seam of a mass of river sands and muds. The intrusion is several times as thick as the complete seam, this being due to the great compression which the coal has undergone, and to the relative incompressibility of the sands. Other curious features which threw light on the physical condition prevailing in Coal-Measure times were examined. In one part of the mine, in an air-passage unfrequented by the miners, was a very beautiful display of ' stalactites,' formed mostly of common salt.

THE BRITISH ASSOCIATION.

Referring to our remarks respecting the postponed meeting of the British Association, which were also voiced at the recent Conference of Delegates in London, we understand that there is a possibility of a meeting of the British Association being held during 1919. The invitation to visit Bournemouth which was made last year still holds good, but if that place is

inconvenient the council will probably consider the possibility of a meeting in or near London.

KELESTOMINÆ : CRETACEOUS CRIBRIMORPH POLYZOA.

At a recent meeting of the Geological Society of London, a paper on 'The Kelestominæ, a Sub-Family of Cretaceous Cribrimorph Polyzoa' was read by William Dickson Lang. He stated :—'The Kelestominæ are a sub-family of Pelmatoporidæ. The latter are a family of Cretaceous Cribrimorph Polyzoa, whose costæ are prolonged upwards as hollow spines from the median area of fusion of the intraterminal front-wall. The broken ends of these spines form a row of pelmata (or, if small, pelmatidia) on the intraterminal front-wall. The Kelestominæ are Pelmatoporidæ with an apertural bar each half of which is bifid ; and the proximal and distal forks of each half are fused with the corresponding forks of the other half. The fused distal forks are also fused with the proximal pair of apertural spines, which are greatly enlarged. The simplest known form of this arrangement is seen in the genus *Kelestoma* Marsson. *Kelestoma* is characterised among the Kelestominæ by its great œcial length, and by the great number of costæ. *Kelestoma* has the following three species, which form a single lineage :—(1) *Kelestoma elongatum* Marsson, with an incrusting asty ; (2) a new species, with a bilaminar, erect asty ; (3) *K. scalere* Lang, with an erect, cylindrical asty. There is, in this series, a slight catagenetic decrease in the number of costæ, and the avicularian aperture becomes somewhat more pointed. The genus occurs in the Senonian zone of *Belemnitella mucronata*, in the island of Rügen.' We are quite prepared to accept his statements, though we are relieved to see that Dr. S. F. Harmer objected to some of the new words employed.

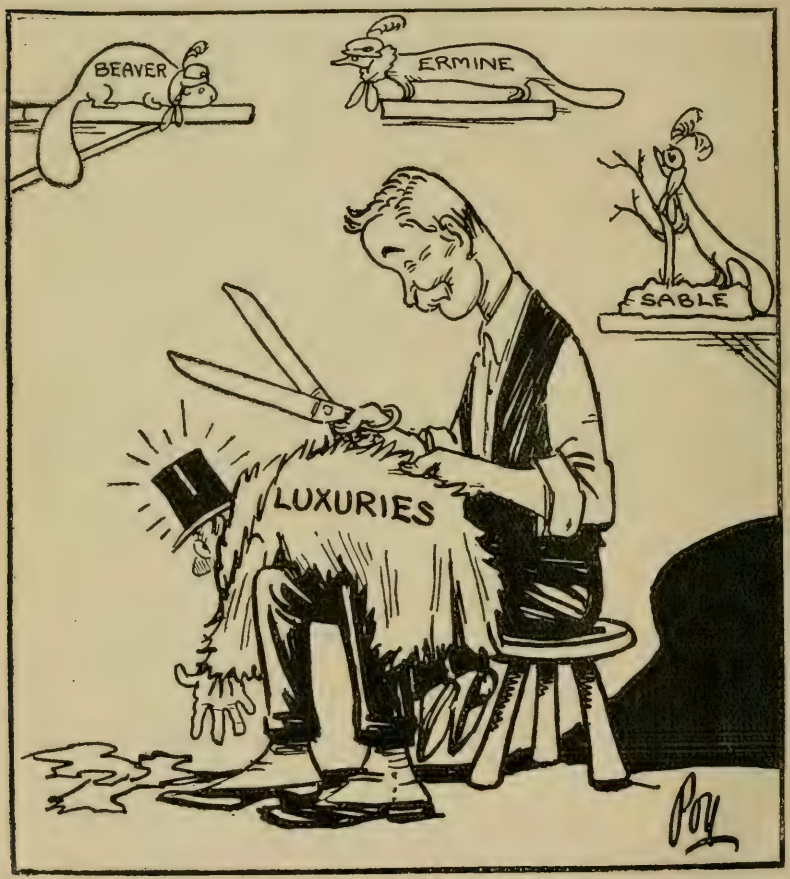
THE PALÆONTOGRAPHICAL SOCIETY.

We are glad to see that Vol. LXX. of the Palæontographical Society's Report just to hand is of the size and importance of the Society's pre-war publications. The present issue contains The Wealden and Purbeck Fishes, part 2, The Piocene Mollusca, part 3, The Palæozoic Asterozoa, part 3 ; by Dr. A. Smith Woodward, Mr. F. W. Harmer, and Mr. W. K. Spencer respectively. There is also a title page and index as well as a 'History of Research' to Part 11 of British Graptolites by Gertrude L. Elles, and Ethel M. R. Wood. Dr. Smith Woodward's contribution is a continuation of his work on the Fossil Fishes, and includes descriptions and illustrations of many important south country examples. Mr. Harmer's monograph is practically a supplement to S. V. Wood's Monograph of the Crag Mollusca, and includes particulars of many important additions to that well-known work, several being from York-

shire, Lancashire, Cheshire, and the Isle of Man. We notice that Mr. Harmer continues to use the somewhat archaic method of using capital letters for specific names. We are also sorry to find that a specimen which he himself formerly considered to be *Trophon Fabricii* is now considered to be a new species, to which he gives the name *Trophon* (*Trophonopsis*) *Kitchini*. Mr. Spencer's contribution deals with an exceptionally difficult branch of Palæontology.

THE TAX—IDERMIST.

By the courtesy of the editor of the *Daily News* we are able



to reproduce one of Poy's cartoons. It represents a well-known Cabinet Minister endeavouring to play the part of a naturalist; if we may judge by his surroundings. But naturalists are born, not made, and we fear our honourable friend may not be quite a success in his new vocation.

A NEW MARINE DEPARTURE.

JOHN IRVING, M.D.,
Scarborough.

SINGULARLY little shore work has been done on our coast since the war commenced. We have almost forgotten how to trip over the slippery rocks without stumbling, or plunging into some *camouflaged* pool. Like a bolt from the blue, while the Scarborough season is at its height, when every man, woman and child has barely time enough to sleep, the authorities at the Food Production Department call upon us to denude the rocks, for miles, of certain sea-weeds, popularly known as Irish, or Carrageen, moss; to wash, bleach, dry, and forward them to London, adding the characteristic remark that it is essentially a *labour of love*. Those who are acquainted with our rocks and know, by experience, the height of the cliffs, will appreciate the word "labour." A prominent official of the Yorkshire Naturalists' Union, in commending this work, said he thought it was one way in which a naturalist could do his 'bit.' If we had him here, we should certainly give him the chance, and would, with much pleasure, watch him careering over the outer rocks of Carnelian Bay judiciously picking clumps of weeds, cramming them into a sack till the sack becomes a firm cylinder measuring approximately a yard in length and half a yard in diameter. On a fine sunny day the process so far might be to him a labour of love, but he has to return with a burden, progressively growing more burdensome, oozing slimy sea-water, now into one shoulder, now into the other, and by the time he has negotiated awkward rocks, boulders, and pools, climbed a two hundred and fifty foot cliff, and walked three miles to the nearest dump, 'labour' consciously takes the precedence of 'love,' and the 'bit' looms large. Let him repeat this performance day after day, and he will assuredly come to the conclusion that the "labour" is somewhat outside the scope of a naturalist, whatever his speciality may be. A lawn has been suggested as a satisfactory dumping-ground where the weeds—and there are tons of them—are to be spread out *thinly*, exposed to sun and rain, fenced by netting (if necessary) against winds which blow, and, as weeds only bleach when kept thoroughly wet, if rains cease to deluge them, a hose or watering-can must be called into play. They are to be regularly turned over, watched till *ivory white*, then cleansed, dried, packed, and sent by rail. If anyone does all this he accomplishes a labour of love, and is worthy of thanks!

Given groups of willing workers, with leisure to take advantage of daily varying low-tides, each group responsible for one day's labour per week, much may be done, but a first-

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day's trial is usually quite enough to satisfy curiosity and damp the ardour of the majority of gushing volunteers. For instance, despite obstacles, Scarborough actually made a start the other day. Twenty collectors, including naturalists of both sexes and children, turned up with a variety of receptacles such as paper-bags, fish-bags, small flower-baskets and long sacks. The man with the sacks did most of the work! Next day there was only one collector, the man with the sacks, a keen naturalist undauntedly doing his 'bit.' He had secured the services of five or six stranger boys and girls to help him to pick and fill his bags. Where were the so-called enthusiasts? The Chairman of the Yorkshire Marine Biology Committee is expected to serve as a Divisional Secretary, find collectors, and organize them, not for scientific research, but to produce jelly! It is a new departure! Needs must. Invalid soldiers and sailors in our Red Cross hospitals require comforts in the shape of jellies. Apparently the dried swimming bladders of sturgeons are non-existent for preparing isinglass. Animal skins, bones, hoofs, etc., are otherwise engaged, so there is no gelatine, and Russian glue, for obvious reasons, is not forthcoming. The alternative for these is bleached Carrageen, which makes excellent jellies at a ridiculously low cost! The results of war cause strange revivals. This is one of them. The Food Production Department hold out the bait of 'revived industry *after war*' as a stimulus to exertion, as if Scarborough would ever be inclined to wrest this monopoly from Ireland. Many of us would prefer purchasing the prepared moss, even at present prices—double the pre-war rate—than personally collect and prepare it. It would come cheaper in the end. This is evidently a war economy; Carrageen, voluntarily supplied f.o.b., should be a great gain on isinglass and gelatine at present fancy prices. Our fighting men, however, must not suffer, and, as far as possible, we accommodate ourselves to departures from custom. Any Yorkshire Naturalists' Union members visiting Scarborough up to the end of October will be given work to do, if they are discovered! What is Carrageen? Two allied sea-weeds, *Chondrus crispus* and *Gigartina mamillosa*, which grow, often together, on rocks near low-tide level. They are of a gristly consistence, four to six inches high, of a purple-brown (almost black from iodine) colour, often crowded with tiny mussels, stems frequently covered with polyzoa, sertularia and other zoophytes, and may occasionally harbour isopods, amphipods, and the nudibranch *Goniodorus*. Apart from an iridescent play of colours in sunlight under water the *Chondrus*, with its bifurcations, is unmistakeable, while *Gigartina*, with its mamillated fronds and fluted stems, is equally distinctive and need not be confounded with other weeds. Having removed the colouring

matter by bleaching, the white weeds are practically vegetable gelatine which, when boiled for ten minutes in twenty or thirty times their weight of water, produces a solidified jelly upon cooling. It is decidedly nutritive, and by digestion may furnish the system with a modicum of sugar.

——: o :——

Same Cuckoo twice making use of same Nest.—Referring to Mr. Massey's note (*The Naturalist*, August, p. 271), with which I quite agree in the main; where we differ is, that he considers no instance can be proved of a Cuckoo having laid twice in one nest. I gave an instance which was satisfactory to me, and I quoted several others, and I think I could quote more of a similar character. Mr. Massey asks if I would give him the weight of the two eggs I mentioned in my previous note (p. 237), but as this occurrence must be nearly forty years since, and I did not retain the eggs, never having had a passion for collections, I am sorry I cannot furnish the necessary particulars; and even if I had the eggs, I question whether this would clear the matter up. I, however, gave one of the eggs to Mr. J. W. Carter, 15 Westfield Road, Heaton, Bradford. He was with me when I found the nest. I cannot remember what became of the other egg, but I never entertained the least doubt but that I was right in my identification of the eggs. However, if I were wrong, can Mr. Massey be absolutely sure that when he says in his note that he has examined seven hundred and seventy-two sets of Cuckoo's eggs (and I am not in the least calling his statement into question) that after all they were Cuckoo's eggs beyond the possibility of a doubt? I am not quite sure, if all the sets of eggs he mentions had been weighed, there may not, after all, be an element of doubt in the matter. Mr. Massey says that he takes it that the instinct of the Cuckoo tells her there would be no room for two young in the same nest, with which I quite agree, if taken in a general sense, but the vagaries of some individual Cuckoos admit of no limit. Individual Cuckoos often violate true instinct much more violently than they do when they lay twice in one nest. In support of this, innumerable instances could be quoted, but this does not disprove that Cuckoos are not guilty of such misdemeanour..—E. P. Butterfield, Wilsden.

Note.—I have twice in my lifetime found two Cuckoo's eggs in one nest, once at Tanfield, in the nest of a Hedge Sparrow, and once on Dartford Heath, Kent, in the nest of a Tree Pipit. There was no possibility of a mistake in either case, but in each it was perfectly obvious that the eggs were laid by different birds.—R.F.

MORE BRONZE-AGE RELICS FROM SCARBORO'.

T. SHEPPARD, M.Sc., F.G.S.

We have already described a large series of Bronze-age relics found in the Cliffs near Scarborough (see *The Naturalist* for May, 1917). At first we thought we had secured the whole of the collection, but others came to light. (See *Naturalist*, September, 1917). Recently two further interesting specimens, figured herewith, have been secured, and now rest with the remainder of the collection. The first is a typical wedge-shaped

socketed axe of similar type to those already described from this hoard. It is in the rough state as it came from the mould, and the cutting edge has not been hammered out nor sharpened. It is square-shaped at the opening; there is a slight medial ridge on each side in the socket, the joints of the moulds are clearly indicated on the sides, and each half is decorated with the usual collar and three ridges—the middle one being the largest—and reaching about half way down the blade. The specimen is $2\frac{3}{4}$ ins. long, $1\frac{1}{2}$ ins. across the cutting edge, and $1\frac{3}{4}$ ins. $\times 1\frac{1}{4}$ ins. across the socket; weight, 5 oz.

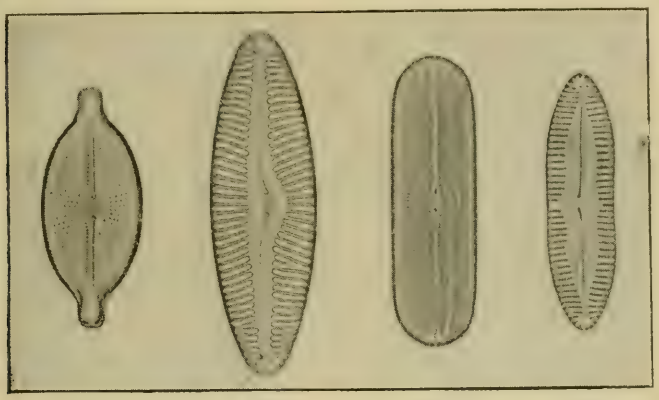
The second specimen is a lump of bronze from the bottom of a crucible. It is flat and somewhat pear-shaped; 2 ins. $\times 1\frac{1}{2}$ ins. $\times \frac{1}{4}$ in.; weight, 2 oz.

THE DIATOM-FLORA OF MARTIN BECK, YORKS.

M. H. STILES, F.R.M.S.

For some time the Doncaster Scientific Society has been engaged in investigating the Natural History of Martin Beck, a district lying about midway between Bawtry and Tickhill, and about nine miles by road from Doncaster. Our first visit was paid in 1910, and I then made gatherings of diatomaceous material, and, from time to time, as leisure permitted, worked upon them.

The results were extremely interesting, but in anticipation of a more thorough examination, the publication of the details was suspended. Last year, however, the investigation was



1 × 830 | 2 × 340 | 3 × 830 | 4 × 875

resumed, and very useful work was done by several of our members and friends. On my part, the old slides were more thoroughly gone over, additional gatherings were made and examined, and I now have the pleasure of submitting a fairly complete record of the Diatom-Flora of a district which has yielded so far 106 species and varieties, 23 of which are not included in West's Alga-Flora of Yorkshire, and 40 have not been previously recorded for the South-west division of the West Riding.

798 *Amphora ovalis* Kutz.
A. ovalis var. *affinis.*
802 *Cymbella cuspidata* Kutz.
803 *C. subaequalis* Grun.
805 *C. affinis* Kutz.
**C. aequalis* Wm. Sm.
**C. pusilla* Grun.
811 †*C. Helvetica* Kutz.
812 †*C. laevis* Naegeli. [Ehr.
820 *Stauroneis Phoenicenteron*
**Stauroneis Gregorii* Ralfs.
821 *S. gracilis* Ehr.
824 *S. anceps* Ehr.
†*S. anceps* var. *linearis.*
826 *Navicula nobilis* Ehr.
†*N. nobilis* var. *dactylus.*
827 *N. major* Kutz.
828 *N. viridis* Kutz.
N. viridis var. *commutata.*
**N. Danensis.*

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832 *Navicula alpina* Ralfs (rare).
833 † *N. borealis* Ehr.
835 † *N. divergens* Ralfs.
837 *N. Brebissonii* Kutz.
* *N. stauroptera* Grun.
* *N. stauroptera* var. *parva*.
838 † *N. Tabellaria* Kutz.
839 *N. gibba* Kutz.
840 *N. bicapitata* Lagerstedt.
* *N. subcapitata* Greg.
841 *N. appendiculata* Kutz.
842 *N. mesolepta* Ehr.
* *N. mesolepta* var. *termes*.
843 *N. Legumen* Ehr.
844 *N. oblonga* Kutz.
849 *N. radiosa* Kutz.
850 *N. cryptocephala* Kutz.
852 *N. rhyncocephala* Kutz.
854 *N. humilis* Donk.
876 † *N. pusilla* Wm. Sm.
882 *N. serians* Kutz.
887 *N. Amphisboena* Borg.
889 † *N. ventricosa* Donk.
890 *N. Iridis* Ehr. [V.H.
N. Iridis v. *Amphigomphus*
N. Iridis v. *Amphirhynchus* De Toni.
N. Iridis v. *affinis* V. H.
N. Iridis v. *producta* V. H.
* *N. Americana* Ehr. (very
891 † *N. Bacillum* Ehr. [rare)
893 *N. Pupula* Kutz.
897 *Van Heurckia rhomboides* Breb.
var. *crassinervis* V. H.
898 *V. H. vulgaris* Thw.
* *Gomphonema constrictum* var. *curta* Ehr.
910 *G. acuminatum* Ehr.
G. acuminatum var. *coronatum* Ehr.
914 † *G. gracile* Ehr.
915 *G. intricatum* Kutz.
G. intricatum v. *vibrio* V.H.
923 *Adnanthidium flexellum* Breb.
925 *Achnanthes microcephala* Kutz.
932 *Cocconeis Placentula* Ehr.
940 *Eunotia Arcus* Ehr.
* *Eunotia Arcus* var. *plicata* Br. and Herib.
E. Arcus var. *minor* V. H.
E. Arcus var. *bidens*.
941 *E. major* Rabenh.
* *E. major* var. *bidens* Rabenh.
942 *E. gracilis* Rabenh.
* *E. pectinalis* forma *curta* Rabenh.
* *E. pechinalis* forma *elongata* Rabenh.
945 *E. Faba* Grun.
* *E. praerupta* var. *curta* Ehr.
949 *E. robusta* v. *tetraodon* V.H.
953 *E. lunaris* Grun.
† *E. lunaris* var. *bilunaris*.
* *E. lunaris* var. *subarcuata*.
956 *Synedra pulchella* Kutz.
* *S. pulchella* forma *major*.
958 *S. Ulna*.
* *S. Ulna* var. *lanceolata*.
† *S. Ulna* var. *aequalis*.
S. Ulna var. *subaequalis*.
959 *S. Acus* Grun.
964 † *S. amphicephala* Kutz.
966 *Fragilaria virescens* Ralfs.
967 * *F. capucina* var. *acuminata* Desmaz.
968 * *F. construens* var. *venter* Grun.
970 *F. mutabilis* (Wm. Sm.) Grun.
* *F. undata* Wm. Sm.
973 *Diatoma elongatum* Ag.
979 *Tabellaria flocculosa* Kutz.
984 *Surirella biseriata* Breb.
985 *S. linearis* Wm. Sm.
987 † *S. robusta* Ehr. [V.H.
S. robusta var. *splendida*
989 *S. ovalis* var. *ovata* V. H.
993 *Hantzschia amphioxys* Grun.
1008 † *Nitzschia dissipata* var. *media* Grun.
* *N. commutata* Grun.
1010 *N. vermicularis* Grun.
1016 *N. linearis* Wm. Sm.
1019 *N. Palea* Kutz.
1029 * *Melosira distans* Kutz.
1037 † *Cyclotella Meneghiniana* Kutz.

In the above list the numbers refer to West's records in the Alga-Flora. A '*' indicates new Yorkshire records, and a '†' new records for the South-west division.

The most noteworthy finds are the following :—

Navicula americana (Fig. 3). Van Heurck mentions this as very rare ; he gives two British records—Ireland (O'Meara) and Loch Kinnord (Davidson). In Schmidt's Atlas 312/15 his illustration of it is endorsed 'England.' There are several

Continental and United States records. It was an unexpected and gratifying occurrence to meet with it at Martin Beck. It should be mentioned that the two specimens found there differ somewhat from the type form described by Van Heurck, the margins of the valves in each case being parallel instead of having a median constriction. In other details they are true to type but not so long, their lengths being respectively 4.2 and 7.5 c.d.m. instead of 9.5 as indicated by Van Heurck. One c.d.m. = 10 mikrons. Mere length in a diatom is, however, by no means a constant character. The illustration represents the longer of the two.

Navicula Alpina (Fig. 2). The only Diatom in the Alga-Flora endorsed 'rare.' As its specific name implies, it is usually met with at a much greater elevation than Martin Beck, which is only about 100 feet above sea-level.

Navicula ignota (Fig. 4). Of this, Mr. F. W. Mills, who has rendered me signal service with regard to several doubtful points in this paper, states :—'The Navicula does not appear to be named, as it is not, I think, mentioned in Clun's Nav. Diat. It is shown, however, in Schmidt's Atlas 43/24, without name, although the stauros is there shown slightly more distinctly than in the photo.' I propose to name this provisionally *Navicula Danensis.*

Navicula pusilla (Fig. 1). The first record for the South-west division of Yorkshire. Although the illustration has been photographed from an imperfect valve, it is, perhaps, on that account the more interesting. During the process of cleaning, the two valves of the frustule had not been separated—this often happens with Diatoms. In this case, one of the apices of the upper valve was broken away and the line of separation distinctly passes through the dots and not between them, showing what is known as the 'postage-stamp fracture.' A careful examination of the illustration will clearly show this and assist in the elucidation of an important fact in Diatom structure, although this feature was evident in the original photo-micrograph, it has been lost owing to the method of reproduction.

—o—

Common British Beetles and Spiders and how to identify them by **S. N. Sedgwick, M.A.** London : Charles H. Kelly (62 pp., price 1/6 net). This book attempts too much at once. In 43 pages, even with the aid of 13 plates, it is obviously impossible to describe adequately the Beetles and Spiders commonly found in Great Britain, and the publishers would have been well advised to have issued a separate volume for each. The illustrations of beetles are reproduced from photographs of carded specimens, and while this treatment gives a fairly good likeness of the larger, it renders the smaller species as hopeless blurs. The book is lightened by a 'General Description' containing the information usually repeated in books of this nature, though we do not remember previously reading that 'the glow-worm, like one of the girl-guides, learns "lamp-signalling" in the dark, whether to summon a husband or a partner to a rich juicy snail supper.' This seems rather hard on the girl guides !

IRISH PISIDIA FROM WINDERMERE.

Rev. C. E. Y. KENDALL, B.A.
Oundle.

Among a quantity of shells of the genus *Pisidium*, which I lately sent to Mr. A. W. Stelfox for identification, are a number from Windermere, which he pronounces to be *Pisidium hibernicum* Westerlund and *P. lilljeborgi* Clessin. The shells were afterwards passed on to Mr. R. A. Phillips and Mr. Charles Oldham, both of whom confirmed his identification. I collected them in October, 1913, from the western (Lancashire) shore of the lake, in shallow water, near Sawrey-on-Windermere, where they were present together, associated with *Pisidium pulchellum* Jenyns and *P. subtruncatum* Malm. Neither of the species has, I believe, been hitherto recorded for North Lancashire.

Pisidium hibernicum, though regarded as an Irish mollusk, seems to have a very wide range of distribution in England and Wales. It has been found at many stations in eight of the Midland and two of the Southern counties.* In Wales it is very prevalent in the mountain tarns. It has, however, only been recorded so far for the North of England from one locality in the Isle of Man, and from Hawes Water, Silverdale, in Mid-Lancashire ; but it is almost certain that, if northern naturalists would collect this genus freely, this species would be found to be as universally distributed in England as in Ireland.

Pisidium lilljeborgi, which was the more abundant shell of the two, is also a species with an extensive range in Ireland, but seems to be distinctly rare in Great Britain. Mr. B. B. Woodward, in his British Museum publication, ' A Catalogue of British Species of Pisidium ' (1913), gives one locality for it in Mid-Lancashire, viz., Hawes Water, Silverdale, and records it from three stations in Carnarvonshire and from four in Scotland. Mr. Stelfox tells me that he has recently seen it from Malham Tarn in Yorkshire, and I have just received some specimens from Mr. Oldham, from Patterdale, in Westmorland. *P. lilljeborgi* is probably a Northern and Alpine species, and shows a strong preference for clear water with a clean gravelly or sandy bottom, so it is probable that this species, too, will be found before long in many more localities in the Lake District and Scotland.

Mr. Stelfox, Ballymagee, Bangor, co. Down, asks me to say that he will be glad to receive for purposes of study collections of Pisidia, and will return the same after identifying them.

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* See 'The Range of *Pisidium hibernicum*,' by Messrs. Phillips and Stelfox in *The Irish Naturalist* of March, 1918.

WESTMORLAND COLEOPTERA.

F. H. DAY, F.E.S.

(*Continued from page 226*).

BRACHELYTRA.

Aleochara curtula Goeze (*fuscipes* Gr.). Melkinthorpe (Britten).
A. bipunctata Ol. Witherslack (Day).
A. lanuginosa Gr. Melkinthorpe (Britten), Kirkby Stephen, Witherslack (Day).
A. sparsa Heer. (*succicola* Th.). Tebay (Bowman), Melkinthorpe (Britten).
A. bipustulata L. (*nitida* Gr.). Melkinthorpe, Ormside (Britten), Witherslack (Day).
Exaleochara morion Gr. Melkinthorpe (Britten), Witherslack (Day).
Oxypoda lividipennis Man. Tebay (Bowman).
O. opaca Gr. Melkinthorpe (Britten).
Ocyusa defecta Rey. Witherslack (Day).
Astilbus canaliculatus F. Tebay (Bowman), Melkinthorpe, Cliburn (Britten), Wild Boar Fell (Day).
Atheta (*Homalota*) *gregaria* Er. Witherslack (Day).
A. tomlini Joy. Melkinthorpe (Britten).
A. elongatula Gr. Melkinthorpe, Cliburn (Britten), Witherslack, Kirkby Stephen (Day).
A. indubia Shp. Witherslack (Day).
A. sodalis Er. Tebay (Bowman), Melkinthorpe (Britten).
A. nigritula Gr. (*boletobia* Th.). Witherslack (Day).
A. inoptata Shp. Melkinthorpe (Britten).
A. reperta Shp. Melkinthorpe, Cliburn (Britten).
A. trinotata Kr. Tebay (Bowman), Melkinthorpe, Cliburn (Britten).
A. euryptera Steph. Witherslack (Day).
A. aquatica Th. Tebay (Bowman).
A. castanoptera Man. (*xanthoptera* Steph.). Melkinthorpe (Britten).
A. pagana Er. Tebay (Bowman).
A. longiuscula Gr. (*vicina* Steph.). Tebay (Bowman), Melkinthorpe (Britten), Witherslack (Day).
A. atramentaria Gyll. Kirkby Stephen (Thompson), Melkinthorpe (Britten).
A. macrocera Th. Witherslack (Day).
A. zosteræ Th. (*nigra* Kr.). Tebay (Bowman), Melkinthorpe (Britten).
A. longicornis Gr. Melkinthorpe (Britten), Witherslack (Day).
A. aterrima Gr. Melkinthorpe, Cliburn (Britten).
A. muscorum Bris. Melkinthorpe (Britten).
A. fungi Gr. Tebay (Bowman), Witherslack, Lowther Park (Day).
A. dubia Shp. Tebay (Bowman), Melkinthorpe (Britten).
A. clientula Er. Melkinthorpe (Britten).
A. analis Gr. Tebay (Bowman), Melkinthorpe, Cliburn Moss (Britten), Witherslack, Lowther Park (Day).
A. cavifrons Shp. Tebay (Bowman), Melkinthorpe, Cliburn Moss (Britten).
Sipalia (*Homalota*) *circellaris* Gr. Tebay (Bowman), Melkinthorpe (Britten), Witherslack, Wild Boar Fell (Day).
Gnypeta coerulea Sahl. Tebay (Bowman), Ullswater district (Rev. T. Wood).
Bolitochara lucida Gr. Rydal (Black).
B. obliqua Er. Tebay (Bowman).
Oligota inflata Man. Melkinthorpe (Britten).
Hypocyptus longicornis Pk. Melkinthorpe (Britten).
H. laeviusculus Man. Melkinthorpe (Britten).
H. seminulum Er. Melkinthorpe (Britten).

Tachinus humeralis Gr. Tebay (Bowman), Witherslack (Day).
T. subterraneus L. Tebay (Bowman), Melkinthorpe, Cliburn Moss (Britten).
var. *bicolor* Gr. Tebay (Bowman), Melkinthorpe (Britten).
T. rufipes De G. Tebay (Bowman), Melkinthorpe (Britten), Shap (Day).
T. laticollis Gr. Tebay (Bowman), Melkinthorpe (Britten).
T. marginellus F. Tebay (Bowman), Kirkby Stephen (Thompson), Melkinthorpe (Britten).
T collaris Gr. Tebay (Bowman), Melkinthorpe (Britten).
T. elongatus Gyll. Ullswater district (Rev. T. Wood).
Tachyporus nitidulus F. (*brunneus* F.). Tebay (Bowman).
T. pusillus Gr. Tebay (Bowman), Witherslack, Shap (Day).
T. chrysomelinus L. Tebay (Bowman), Melkinthorpe, Cliburn Moss (Britten), Witherslack, Ravenstonedale, Lowther Park (Day).
T. hypnorum F. Tebay (Bowman), Melkinthorpe, Cliburn Moss, Pooley Bridge (Britten), Witherslack (Day).
T. solutus Er. Witherslack (Day).
T. obtusus L. Tebay (Bowman), Melkinthorpe, Cliburn Moss (Britten), Witherslack, Lowther Park (Day).
var. *nitidicollis* Steph. Tebay (Bowman), Melkinthorpe (Britten).
Conosoma pubescens Gr. Melkinthorpe (Britten).
Bryocharis (*Megacronus*) *analis* Pk. Tebay (Bowman).
Bolitobius pygmæus F. Tebay (Bowman).
B. lunulatus L. Melkinthorpe (Britten).
Mycetoporus splendidus Gr. Tebay (Bowman).
M. longulus Man. Lowther Park (Day).
M. clavicornis Steph. Tebay (Bowman).
Quedius longicornis Kr. Tebay (Bowman).
Q. mesomelinus Marsh. Tebay (Bowman), Melkinthorpe (Britten).
Q. maurus Sahl. (*fageti* Th.). Melkinthorpe (Britten).
Q. cinctus Pk. Melkinthorpe (Britten), Witherslack (Day).
Q. fuliginosus Gr. Tebay (Bowman), Kirkby Stephen (Thompson), Melkinthorpe (Britten).
Q. tristis Gr. Melkinthorpe (Britten).
Q. molochinus Gr. Tebay (Bowman), Melkinthorpe, Cliburn (Britten).
Q. nigriceps Kr. Tebay (Bowman).
Q. maurorufus Gr. Tebay (Bowman), Melkinthorpe (Britten).
Q. scintillans Gr. Tebay (Bowman).
Q. auricomus Kies. Tebay (Bowman).
Q. rufipes Gr. Tebay (Bowman), Melkinthorpe (Britten).
Q. fulvicollis Steph. Tebay (Bowman).
Q. boops Gr. Tebay (Bowman), Melkinthorpe, Cliburn Moss (Britten).
Creophilus maxillosus L. Tebay (Bowman), Melkinthorpe (Britten).
Staphylinus pubescens De G. Tebay (Bowman).
S. erythropterus L. Tebay (Bowman), Ullswater district (Rev. T. Wood), Brough (Thompson).
S. globulifer Geoff. (*morio* Gr.). Melkinthorpe (Britten).
Philonthus splendens F. Tebay (Bowman), Melkinthorpe (Britten).
P. laminatus Creutz. Tebay (Bowman), Melkinthorpe (Britten), Ravenstonedale (Day).
P. æneus Ross. Tebay (Bowman), Melkinthorpe (Britten).
P. chalceus Steph. (*proximus* Kr.). Tebay (Bowman), Witherslack (Day).
P. carbonarius Gyll. Tebay (Bowman).
P. decorus Gr. Tebay (Bowman), Melkinthorpe (Britten).
P. varius Gyll. Tebay (Bowman), Melkinthorpe (Britten), Witherslack (Day).
P. marginatus F. Melkinthorpe (Britten).
P. varians Pk. Tebay (Bowman), Witherslack (Day).
P. albipes Gr. Tebay (Bowman).
P. fimetarius Gr. Tebay (Bowman), Melkinthorpe, Cliburn (Britten).

Philonthus cephalotes Gr. Tebay (Bowman), Melkinthorpe (Britten).
P. umbratilis Gr. Tebay (Bowman), Melkinthorpe (Britten).
P. nigrita Nor. Tebay (Bowman).
P. micans Gr. Cliburn Moss (Britten).
P. fulvipes F. Tebay (Bowman).
P. puella Nor. Tebay (Bowman).
Othius punctulatus Goeze. (*fulvipennis* F.). Tebay (Bowman), Melkinthorpe (Britten).
O. melanocephalus Gr. Tebay (Bowman), Melkinthorpe (Britten).
O. myrmecophilus Kies. Tebay (Bowman), Melkinthorpe, Cliburn Moss (Britten).
Baptolinus affinis Pk. (*alternans* Gr.). Cliburn (Britten).
Xantholinus punctulatus Pk. Tebay (Bowman), Melkinthorpe (Britten).
X. ochraceus Gyll. Melkinthorpe (Britten).
X. linearis Ol. Tebay (Bowman), Melkinthorpe (Britten).
X. longiventris Heer. Melkinthorpe (Britten).
Lathrobium geminum Kr. (*boreale* Brit. Cat.). Tebay (Bowman), Melkinthorpe (Britten).
L. fulvipenne Gr. Tebay (Bowman), Kirkby Stephen (Thompson), Melkinthorpe (Britten).
L. brunnipes F. Tebay (Bowman), Melkinthorpe (Britten).
Stilicus orbiculatus Pk. (*affinis* Er.). Melkinthorpe (Britten).
S. ericsoni Fauv. (*orbiculatus* Er.). Melkinthorpe (Britten).
Dianous cærulescens Gyll. Tebay (Bowman).
Stenus clavicornis Scop. (*speculator* Lac.). Tebay (Bowman), Melkinthorpe (Britten).
S. nanus Steph. (*declaratus* Er.). Tebay (Bowman), Melkinthorpe (Britten).
S. brunnipes Steph. Tebay (Bowman), Melkinthorpe, Cliburn, Shap (Britten).
S. similis Hbst. Tebay (Bowman), Melkinthorpe (Britten), Witherslack, Kirkby Stephen (Day).
S. picipes Steph. Melkinthorpe (Britten).
S. nitidiusculus Steph. Lowther Park (Day).
S. flavipes Steph. Melkinthorpe (Britten), Witherslack (Day).
S. impressus Germ. Tebay (Bowman), Melkinthorpe (Britten), Witherslack (Day).
Platystethus arenarius Fourc. Melkinthorpe (Britten), Witherslack, Gaisgill (Day).
Oxytelus rugosus F. Tebay (Bowman), Melkinthorpe (Britten).
O. laqueatus Marsh. Tebay (Bowman), Melkinthorpe (Britten), Kirkby Stephen (Day).
O. sculptus Gr. Tebay (Bowman).
O. sculpturatus Gr. Witherslack (Day).
O. nitidulus Gr. Tebay (Bowman), Melkinthorpe (Britten).
O. tetracarinatus Block. Tebay (Bowman), Kirkby Stephen (Thompson), Melkinthorpe (Britten), Witherslack, Lowther Park (Day).
Trogophlæus arcuatus Steph. Melkinthorpe (Britten).
T. bilineatus Steph. Melkinthorpe (Britten).
T. rivularis Mots. Melkinthorpe (Britten).
T. pusillus Gr. Melkinthorpe (Britten).
Coprophilus striatulus F. Melkinthorpe (Britten).
Anthophagus caraboides L. (*testaceus* Gr.). Tebay (Bowman).
Lesteva pubescens Man. Tebay (Bowman), Melkinthorpe (Britten).
L. longelytrata Goeze. Tebay (Bowman), Melkinthorpe (Britten).
L. heeri Fauv. (*sicula* Brit. Cat.). Tebay (Bowman), Rydal (Black), Cliburn, Askham Fell (Britten), Witherslack (Day).
Olophrum piceum Gyll. Tebay (Bowman), Kirkby Stephen (Thompson), Melkinthorpe, Cliburn (Britten).
O. fuscum Gr. Tebay (Bowman), Melkinthorpe, Cliburn (Britten).

Lathrimæum unicolor Steph. Tebay (Bowman), Melkinthorpe, Cliburn (Britten).
Deliphrum tectum Pk. Tebay (Bowman).
Philorinum sordidum Steph. Cliburn (Britten), Witherslack (Day).
Xylodromus concinnus Marsh. Tebay (Bowman), Melkinthorpe (Britten).
Phlæonomus pusillus Gr. Tebay (Bowman).
Homalium rivulare Pk. Tebay (Bowman), Melkinthorpe (Britten).
H. oxyacanthæ Gr. Tebay (Bowman), Melkinthorpe (Britten).
Phyllodrepa ioptera Steph. Tebay (Bowman), Melkinthorpe (Britten).
P. vilis Er. Tebay (Bowman).
Anthobium ophthalmicum Pk. Melkinthorpe (Britten).
A. sorbi Gyll. Tebay (Bowman), Melkinthorpe (Britten), Lowther Park, Witherslack (Day).
A. minutum F. Witherslack, Lowther Park (Day).
A. torquatum Marsh. Tebay (Bowman), Witherslack, Lowther Park (Day).
Proteinus ovalis Steph. Tebay (Bowman), Melkinthorpe, Cliburn (Britten).
P. brachypterus F. Tebay (Bowman), Melkinthorpe (Britten).
A. limbatus Mäkl. (*crenulatus* Pand.). Melkinthorpe (Britten), Witherslack (Day).
Megarthrus depressus Pk. Tebay (Bowman), Melkinthorpe (Britten).
M. sinuatocollis Lac. Tebay (Bowman), Melkinthorpe (Britten).

(*To be continued*).

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ENTOMOLOGY.

Cucullia verbasci at Bradford.—Respecting Mr. Porritt's note on July 9th, when in the Botanical Gardens in Lister Park, I saw three very large specimens of *Verbascum* in close proximity, and at once approached them to look more particularly for *Cionus*, but when three or four yards away was surprised to see, resting at full length on the stems, several full-grown larvæ of *Cucullia verbasci*. There were several more not quite half-grown, and on August 1st were several not yet full-fed. Another species of *Verbascum* about half a dozen yards away was quite free from them. *C. verbasci* is not new to this district; it has been found in gardens on two or three different occasions. The imago, however, so far as I know, has never been seen in the district.—J. W. CARTER, Bradford.

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BOTANY.

Lepidozia trichoclados K. Müll. in Cumberland.—In February last, I found this minute plant growing freely among other Hepaticæ (chiefly *Aplozia crenulata* (Sm.) Dum.) on Orton Common, about four miles west of Carlisle. They were covering the sides of one of the numerous drains which intersect this piece of Common, the soil of which is moist and peaty. It is apparently not common in England, being recorded from only five other English counties, but it is more widely known from Scotland. It may be that it is overlooked as a small form of the commoner *L. setacea* (Web.) Mitt. It is new to vice-county 70. Mr. W. Ingham has kindly verified my gathering.—JAS. MURRAY, 2 Balfour Road, Carlisle.

THE GEOGRAPHICAL DISTRIBUTION OF THE MOTHS OF THE SUBFAMILY BISTONINAE.

J. W. HESLOP HARRISON, D.Sc.

(*Continued from page* 194).

And the only direction left for consideration is that toward Asia. Very tempting is the configuration of the long chain of islands, hinting at continuity at no remote geological period. But between Asia and Australia, almost gossamer-like in its outward appearance, is that narrow strait just east of Java between Bali and Lombok. It is in truth a ' great gulf fixed ' almost impassable for bird, beast, and insect. So few are the forms (they exist of course) which have transgressed this boundary line that the few which did, and now appear as an Indo-Malayan leaven of the Flora and Fauna of New Guinea, Australia, and the Celebes are explicable on the basis of the many accidents that time produces. None are flagrant breaches of our expectations.

The strait between Bali and Lombok must be of extraordinary age, for it brings back once again to our eyes those early days when Australia was as well off in its plants and animals as the rest of the world. No form is more emphatic in asserting this than the Secondary Cossid genus, *Xyleutes*, mentioned before, as to it the barrier was non-existent, it occurring in Borneo, India, Ceylon, and the Philipine Islands. Thus nothing can be gained from the East Indies.

Our search for the desired passage must be directed elsewhere. But where shall we look ? Suggestive land bridges simply do not exist. Still what do the soundings tell ? We see an interesting series of shallows stretching from New Zealand, extending up to and including New Caledonia where similar shallows, striking tangentially from the coast of New South Wales, meet them. Further, without significant break, these shallows are prolonged *via* the Caroline, Ladrone and Bonin Islands to the South East of Japan, and we are brought up exactly in the area with which our linkages must be made.

Note the significance of this line ; it coincides with the Western Pacific Belt of volcanic action, and in addition these islands, in sharp contradistinction with most Pacific Islands, are composed of volcanic rocks in many cases of immense age.

Of volcanic origin, then, and lying on the line of perpetual volcanic action and seismic disturbances, they must have been prone at any time to excessive uplifting which would produce peninsulas or isthmuses of the Panama or Malay type, down which would pass, as in America, a backbone of lofty mountains of which the rudiments attaining a height of 2,000 feet or even 3,000 feet persist to this day.

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Evidently, if this were the route, other species of varying relationships should exist at different points of the broken fragments of the bridge, and, fortunately, such can be produced. The former connection of the Ladrones and Carolines with the Palæarctic region needs no better example than that afforded by their possessing one of our ordinary Fritillary Butterflies of the genus *Argynnis*, and we shall, in consequence, not linger here.

So, too, the linking up with New Zealand is not a tedious undertaking, so many instances of various values and types being procurable. Take, for example, the very characteristically Palæarctic plant subfamily *Caprifoliceæ*. Look at this selection of its contents :—

Genus *Caprifolium*. Distribution :—Holarctic.

Genus *Weigalia*. Distribution :—North East America and Eastern Asia (note the valuable hint as to its age and origin provided by its discontinuity).

Genus *Aleuosmia*. Distribution :—New Zealand.

Genus *Abelia*. Distribution :—China and Japan.

Comment is superfluous ; the areas cited must have been joined up in a manner allowing of the migration of temperate forms.

Further, consider the whole of the Natural Order *Elæocarpaceæ*, in particular the type genus *Elæocarpus*, found in New Zealand, E. Asia, Japan, and the Sandwich Islands. Examine it in conjunction with the closely related *Antholoma* and *Duboutzia* from New Caledonia, and again the old path available between Japan and New Zealand is clearly indicated. If still further examples are needed, many may be quoted, but we shall content ourselves with the mention of two more, one the Composite genus *Lageniphora*, found in the East Indies, Japan, and New Zealand, useful as driving home the lessons of the preceeding, and, lastly, the Natural Order, the *Araliaceæ*, which occurs in all moods and tenses at all parts of the suggested route and its surroundings. Moreover, the case of this order presents us with a curious and forceful fact, and that is the enormous number of endemic genera evolved within its limits in New Caledonia, implying that this important island was much more extensive in past epochs than now, and that, therefore, in the New Caledonian neighbourhood, the land connexions we have postulated attained their maximum breadth ; this statement the soundings confirm.

To forge the last link of the chain is our next task, and that is to adduce examples bringing New Caledonia, Australia and New Zealand into contact. Of all the admirable examples to be used, none will stand us in better stead than the plant Natural Order, *Epacridaceæ*, for its whole tendencies are temperate. No better choice from it can be chosen than the

genus *Epacris* itself; it may be found in New Caledonia, Australia, and New Zealand, as is also the case with the allied genus *Dracophyllum*. And these two are not isolated examples; scores of genera equally satisfactory will serve to weld this chain.

Thus, in the plethora of instances quoted, we have abundant proof that a passage from Japan to New Zealand existed *via* New Caledonia, whence a branch struck off to Australia.

Obviously, the continued existence of a route of this type midst volcanic surroundings would be very precarious and always unstable, never probably quite continuous at one time, and thus presenting to creatures attempting to use it enormous difficulties. Nevertheless, the bridge afforded similar facilities, to a less extent, but still parallel to those offered by the Central Plateau of Africa and by the Rocky Mountains and Andes of America. Furthermore, the opportunities were to all intents and purposes restricted to organisms of the same physiological character, *i.e.*, those delighting in cold, temperate, Alpine, or Subalpine habitats.

By this attenuated basaltic chain, therefore, the Coppers of the genus *Chrysophanus* passed to Australia, Tasmania, and New Zealand, as did likewise the *Erebiæ*, the Water Crowfoot (*Ranunculus aquatilis*) and the various grasses named above (than which no better hall-mark of the quality of the passage can be obtained). Lastly, by its means *Lophodes sinistraria*, typically and purely Bistonine in its antennæ and genitalia—nay, evidencing in both a close affinity with the base of the *Lycia-Palæonyssia* stem—colonised Australia when as yet that continent was united to Tasmania, for as a peninsula the latter had been occupied before the rollers of the Pacific had carved for themselves the Bass Straits.

That few representatives of the temperate forms find a place in New Caledonia and the adjoining islands cannot be wondered at. Relatively lower now, and situated only 20° from the Equator what forms have managed to prolong their existence there have long since by transformations of diverse degrees and types resulted in species helping to swell the huge masses of endemic genera, species and even orders that the island possesses; and in an analogous way, but to a less extent, like forces have been at work in Australia.

Evolution of this nature, added to the narrow and upland character of the bridge, tells us with no uncertain voice why the remnants of the migrating forms are now so few in number and further, from the latter feature, we gather why the higher groups of both animals and plants are not included, although the isolated Australian Bustard (*Otis australis*) may indicate a successful attempt of one such organism to force the passage.

THE CAUSE OF THE ATTRACTION IN THE PAIRING OF LEPIDOPTERA.

B. MORLEY.

To Major Smart's interesting note on the pairing of *Hepialus hectus*, in *The Naturalist*, p. 269, I should like to make an observation. The species in question pairs about sunset, and the couples hang from the underside of the bracken fronds, but although they are fairly well concealed, the quick eyes of the night-jar detect the easily obtained food supply, and by gliding under the ferns, takes the unsuspecting moths into its spacious gape as it flies along and procures a good meal without much trouble. Although this takes place while it is still quite light, I have never noticed the birds hawk after the flying moths of this species.

With regard to the cause of attraction in the pairing of moths, in *The Naturalist* for July, pp. 234-5, is a note of mine on the pairing of *Hepialus lupulinus*, where a suggestion is made that the wing vibrations of the female are the means used for attracting the male to her. Anent this suggestion is an editorial note unceremoniously sweeping it aside as a fairy tale. Fairies, like ghosts and mermaids, are creatures that only exist outside the limits of cognition, and are the creation of minds which think irrational thoughts, but why communication by means of vibration should be classed with such mythical creatures is hard to understand. Surely communication by means of the human voice and the various forms of telegraphy are only possible by reason of vibrations. As regards sound vibrations, they travel much further and more freely with the wind than against it. Much research has recently been made into biological structure of the various interior organs, and especially the genitalia of Moths, but by the published accounts of the discoveries made scent glands are not present in the bodies of the females, or if they are nothing is said about them. Why then, should the wing vibrations, which we know by observation are actually made, be discounted, and primary importance be given to a scent which we cannot detect. Experience teaches us that where scent is present in animals it is exuded from a gland, and the only logical way of reasoning is by experience, otherwise it is mere speculation; consequently, until such times as scent glands are proved to exist the scent theory of attraction must be banished into the region where fairies dwell, and in the meantime it may not be altogether profitless to work out the possibilities of communication by vibrations as a necessary preliminary to moth copulation.

For a number of years the writer has been sceptical as to the generally accepted theory of the cause of moths being attracted to light. One fully realizes the gravity of attacking an old established theory and expects much unreasonable condemnation for his temerity. Nevertheless, for the sake of truth, risks are worth taking. The reason given as the cause of this attraction is that all the facets composing the eyes become filled or flooded with the rays of light, thus rendering the insect totally incapable of seeing anything except the light; therefore, if it flies at all, it is bound to fly to the light, because it is the only object it can see. Strange to say, however, it is a fact that most of the moths thus attracted are males, indeed, the extreme rarity of a female being found at light may safely be dismissed as accidental. One has never seen a convincing explanation of this well-known fact. Now, the females of each species of night-flying moths have eyes identical in structure with those of the males, and so far as one knows, they can see just as well as the males; that they also fly freely is manifest, for they visit the 'sugar' patches in about the same numbers as the males. While in the act of flying it is supposed that they are just as liable to fly into the region near a light as the males are, and if the illuminated facet theory is correct they should be just as liable as the males are to light attraction, but the truth is that they are not so, and one

suspects speculation as the origin of the theory as a consequence. Even the males are spasmodic in their visits to light. On some nights there is no attraction for any species; on others, certain species come freely, while at other times still other species are the only visitors. Thus, on Wicken Fen, where light is the principal mode of collecting, the terms are 'a bad night,' or 'an *albovenosa* night,' or 'a *quercifolia* night,' and so on. It would seem therefore that certain atmospheric conditions are against the attraction altogether, while other conditions are suitable to other species. Yet again there are still other problems; geometrid species like *Scotosia vetulata* and *S. rhamnata*, which were both common on the fen in early July, 1912, both at the sugar posts and flying around buckthorn bushes, contrary to the expectations of the writer never put in an appearance at light at all.

It is a fact that there cannot be a light without heat and the consequent vibrations, and possibly with the proper atmospheric condition to give the exact tone to the vibrations it is probable that the males of every species of night-flying moth in existence could be attracted, while on the other hand the females are not responsive to the vibrations because there is not the least reason why they should be.

[Surely Mr. Morley's first note (pp. 234-5) is ample proof that scent is the attraction. He tells us that after he had boxed the pair of moths, and placed the box a few yards away on the ground, none of the flying males ever flew near it, but that in the immediate space around where the female had been, the males eagerly searched for her for towards twenty minutes. There could be no vibration then, but the scent evidently remained for that time before it completely evaporated. Besides, many female moths, probably the vast majority indeed, do not vibrate their wings at such a time. After the wings are fully dry, except that their position is changed as darkness approaches in the evening, they remain apparently absolutely quiescent until pairing occurs. Moreover, some female moths have no wings, and so cannot vibrate them. I have known a female *Nyssia hispidaria*, a perfectly wingless moth, caged up in Epping Forest, attract a large number of males. There is practically no doubt that scent is the attraction.—G.T.P.]

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Eccentric Nests of Humble Bee. — Early in August my attention was called to two nests of Humble Bees on Kingsland, Shrewsbury. The first was on the flagged floor of a cupboard in a disused stable, and was a domed mass about twelve inches in diameter, composed entirely of bits of hay and paper which the bees (*B. lapidarius*) had bitten off the larger pieces which littered the adjacent floor. The other nest was that of the Common Humble Bee (*B. terrestris*) and was not remarkable in itself, but from its juxtaposition to a Wasp's nest. A friend of mine had destroyed a Wasp's nest in a hedge-bank, and went to dig it out. As soon as he began to do so he was astonished to see a number of Humble Bees about it. On opening the bank he discovered that the entrance hole was common to two nests; from this hole two passages branched—that to the left leading to a Wasp's nest, in which all the insects were dead; while that to the right led to a Humble Bees' nest, the insects in which were all 'alive and kicking.' It seems strange that bees and wasps should thus dwell together amicably, and both use the same vestibule.—H. E. Forrest.

ORNITHOLOGICAL OBSERVATIONS AND REFLECTIONS IN SHETLAND.

EDMUND SELOUS.

(*Continued from page 160*).

OCTOBER 19TH.—The Heron, here, stalks along the steep and sea-weed-slippery rocks, as he does along the mud and reedy verge of his more familiar surroundings. I see him, after a short stroll of this description, descend into the water, and stand, with neck held straight and rigid, the head and long beak projecting in one line, at right angles from the end of it, like the spike of a pickaxe. One moment, the whole implement, without any flexuous curve in it, approaches nearer to the water—as a pickaxe itself would, if stood on its handle and pivoted forward—retires again, again approaches, and then the pick—now a spear—is, with its shaft, darted in—the direction being, now, more horizontal—and returns with a small fish transfixed, so it appears, upon its point—held, at least, by the very point, from whence it is gulped hastily down. After this, there is a little more waiting, but, nothing resulting from it, the bird becomes impatient, and resumes its advance. At first he wades through the water, but soon remounts the rocks, and from first one and then another that stands at some height above it, he cranes and peers into the sea, thus, as it would seem, purposely adding to the vantage of his height. At length, having made his dispositions, he comes cautiously down, and standing amidst a flux of brown seaweed, he, in a moment or two, lances into it, and again secures something, though still quite small. But this time, the motions are different, and the neck, though never as represented in pictorial fiction, is more curved, to meet new exigences of circumstance.

When a little band of Ring Plovers are put up, they fly out very gracefully, over the sea, keeping all in a cluster together, the inner surface of their wings shining out, like morning light, all at once, for a little, and then eclipsed in brown twilight. They are beaten continually, and, slenderly pointed as they are, with a graceful backward curve, this has a very pretty effect. A special point, both of beauty and interest, in their flight, is the way in which they all suddenly turn and curve off at a tangent to the curve—for they abhor a straight line—in which they have, till then, been proceeding. How do they all choose, exactly the same moment, to do this? Why do they never fly against each other or float upon each other's toes—or tails? A little before alighting—over the water still, but nearing the shore—they cease beating their wings, and glide in on them, holding them rigidly, sometimes with the same backward curve, sometimes straight out, or

more nearly so. What it is they pick up off the wet sand, as they appear to do—something—continually, it is difficult to make out, except that it is very minute. After-examination of the spot detects nothing, nor do the glasses reveal anything held in the bill. The sand is covered with the castings of sea-worms, and, every now and again, one of these creatures shoots up a miniature geysir, from his burrow which causes a mild degree of surprise, sometimes, in a bird that happens to be near it. But in sea-worms the Ring Plover does not seem interested. He pecks and pecks up, elsewhere, where there seems to be nothing, and it is nothing that he would seem to get, though doubtless, he knows his own affairs. The little piping note that these birds make, along the shore, is like "piffany, piffany, piffany, piffany," or "tiffany, tiffany, tiffany, tiffany," or "tiffany, piffany, piffany, tiffany,'—for now it sounds like one, and now the other. They also cry, dwelling more than we do on the last syllable: 'Cheery, cheery, cheery, cheery,' and all their ways and actions are an eloquent discourse on this theme.

A Starling perched on a lamb's back, but he soon flies off it, on to the ground, near one of its feet. But he does not search the foot, and is soon feeding, with another Starling, farther off. The little flock, on the sheep, the other day, never searched or pecked into its wool—did not seem to think of it. They certainly, I think, use the sheep as perches merely—often at least—and may like their warm wool. On the occasion referred to, it was towards evening, and the Starlings were on their way to roost, I think. Sheep and cows, here, take, for the Starlings, the place of trees or bushes, elsewhere. They may search them, too, sometimes. Certainly they would, one would think, being there, if it were worth their while—but that is the point. They come down on to the rocks, now, and search the seaweed, but not very profoundly, uttering their pleasant sing-song, the while.

Have just seen a Herring Gull attacked by a Shag. I was watching the Shag, as it swam, through the glasses, and, out of the corner of them, caught sight of the Herring Gull, not far off it. Just as I did so, the Shag dived, and coming up, near the intruder (so considered), passed towards him over the water, snapping his bill. As he arrived, the Herring Gull flew a little way, and came down on the water, again, whether after receiving a bite or two—for that, with his hooked bill, was the Shag's method—I cannot say, but think he just avoided this. The Shag then dived again, and, a moment or two afterwards, the Gull uttered a sudden, short cry, evidently of pain, and flew right away. As he rose, so did the Shag, just beneath him. This time he had exactly measured the distance, and attacked the Gull from below. No doubt, though this

was lost to me, he used his bill as he had threatened with it, and, in doing that, he opened and shut the mandibles, not widely, but quickly and continuously. Were the bill pointed, it would, no doubt, be used to thrust with, as is that of the Grebes and Divers. The hook, though it makes this impracticable, must be a formidable implement for seizing, grappling and biting, as I suppose is the mode of procedure. Probably the opening and shutting of the mandibles makes a clattering noise, but I was not near enough to hear this, either to-day or some days previously, when I also witnessed the action. Later, this afternoon, on a certain rock, at the entrance of the voe, which is a regular shag gathering place, a young bird was most importunate with its mother (presumably) to feed it, pursuing her about over the rock, shaking and spreading out its wings. The mother's only remedy against this—for she would not comply with the demand—was to retreat and, at last, fly down upon the water, where, being followed and pursued by her child, she dived. I do not know why this strategy should have been successful, considering the species, but it was.

A fleet of Shags swam right up the voe, this morning. I saw them on first looking out of my little window, at about 8 o'clock—for there is no special advantage in early rising, at this time of the year. A little after I had come down and had breakfast, they began to swim back again. I counted seventy-six, and do not think I was far out, though they all leapt and dived, from time to time. At any rate, if I erred at all, it was on the side of moderation, and Mr. Hay thought that there were many more. This is a very different kind of fleet from that of the Swans on the eleven-miles-long strip of water behind the Chesil Bank—itself the Fleet, whether therefore so named I know not. A dark pirate flotilla they looked, as against that silver, fairy one. Still they had a very pleasing appearance, and if less graceful and stately—what bird could compete here?—on the other hand, were more their craft's masters, as was particularly apparent in their diving. Schools of Purpoises were also playing (as daily) in the perfectly still water; yet no calmer here, in the voe, now, than in the open sea outside. Every now and again, one or other of these Porpoises makes a violent rush through the water, which foams about him, and I saw one resting upon it, straight out, at full length, so that his head and muzzle were plainly visible, having a porcine appearance. These are pleasing interludes from the perpetual monotonous roll.

And to crown all (as they might think) two male Eider Ducks have come far up, and now begin to swim out, again, side by side, but with a yard or so between them, in a very regal manner—'two households, both alike in dignity.'

(*To be continued*).

Naturalist,

YORKSHIRE NATURALISTS AT CROSSHILLS.

The two hundred and seventy-third gathering of the Union at Crosshills, on Saturday, July 13th, was a pronounced success, due in no small degree to the excellent local arrangements made by Mr. John Holmes and his enthusiastic colleagues of the Crosshills Naturalists' Society. The Haworth Ramblers' Association also took part in the excursion, thus swelling the attendance, which was close upon eighty. The weather being ideal, the selected routes gave ample recompense to those who took advantage of the many natural delights which the valleys of Glusburn and Lothersdale afforded. The geologists were under the guidance of Mr. John Holmes and the naturalists were led by Mr. H. Cowling. The latter party had also the company of the local historian, Mr. John Stell, who gave valuable and interesting information concerning the residences at Malsis and Carr Head and other places of interest along the route traversed.

The meeting at the close of the excursion was held in the Glusburn Institute, Dr. A. Gilligan, F.G.S., presiding. Excellent sectional reports were given by Mr. J. Holmes on geology; Mr. G. Fysher on conchology; Mr. H. Cowling on flowering plants; Mr. C. A. Cheetham on mosses; Mr. R. F. Jones on fungi; Mr. H. B. Booth on vertebrate zoology; Mr. R. Butterfield on entomology. A vote of thanks to the landowners for the privileges so kindly granted to visit their estates, to the guides, and to the members of the Crosshills Naturalists' Society for the local arrangements, was heartily carried on the motion of Mr. W. P. Winter, B.Sc., seconded by Dr. Woodhead, M.Sc.—W.E.L.W.

Vertebrate Zoology.—Mr. H. B. Booth writes:—Perhaps the most interesting birds noticed were two separate parties of Bullfinches and a Kestrel. Spotted Flycatchers and Magpies were numerous. But the number of birds seen was scarcely up to expectations in such a charming district, even in July. The scantiness of undergrowth in the woods would no doubt chiefly account for the scarcity of the Warblers in the district investigated. Many species, usually generally distributed, such as Yellow and Pied Wagtails, Skylarks, Tree and Meadow Pipits, etc., were either absent or uncommon.

Conchology. — Mr. Greevz Fysher writes:—The Conchologists traversed the Glusburn Valley, and noted *Vitrina pellucida, Hyalinia alliaria, Succinea putris, Planorbis albus, Limnæa peregra, Valvata piscinalis, Paludestrina jenkinsi, Sphærium corneum, S. lacustre, Pisidium subtruncatum.*

Hymenoptera, Diptera and Hemiptera.—Mr. R. Butterfield reports:—On the heads of thistles the inquiline bees *Psithyrus quadricolor* Lep., *P. campestris* Panz., and a variety of *P. vestalis* Fourc., were seen. During sunshine the handsome flies *Volucella pellusens* L., and *Chrysotoxum arcuatum* L. were seen in the gardens at Carr Head. By sweeping near Carr Head I captured a number of Hemiptera, the Psyllidæ being particularly abundant.

Botany: Algæ.—Mr. Alfred Wilman reports that he found *Melosira varians* Aq. in Gill Beck together with three species of Spirogyra in conjugation.

Flowering Plants.—Mr. Wattam writes:—Charming indeed is the wooded valley of Glusburn, and the typical flora of the grits and boulder clay was ever pleasing. Portions of the waters of the lake in the grounds at Malsis were gay with the blooms of *Nuphar luteum* and alongside the borders *Menyanthes trifoliata,* still displaying a few blossoms, thrives wonderfully well, and there are some well established clumps of *Lythrum salicaria.* On leaving these grounds the route traversed lay alongside the beck as far as the ruined mill at Cowling Head. *Lactuca muralis, Crepis paludosa, Campanula latifolia,* and *Orchis maculata* were not uncommon plants, and just beyond the mill there is an abundance of *Equisetum maximum*; *Polypodium vulgare* was also noted. The Bird Cherry is a

common tree, but bearing little fruit; seedlings of Beech and Mountain Elm were gathered. The old fish pond near to Carr Head Hall was tenanted by *Nasturtium officinale*, *Epilobium palustre*, *Scrophularia aquatica*, *Alopecurus geniculatus* and *Glyceria fluitans*. The arboreal features of the grounds at Carr Head are very fine, especially conspicuous being magnificent examples of Beech and Mountain Elm. Close to the Hall are examples of uncommon trees, chief of which are the Redwood, Cedar of Lebanon, Fern-leaved Beech, Magnolia, *Tilia platyphyllus* var. *asplenifolia*, variegated Oak and Sycamore. Particularly noticeable was a young branch on the bole of a Mountain Elm, the leafage of such branch being of a uniform cream tint. The gardener (Mr. Fisher) stated that this particular branch had borne this phase of foliage for many years, but the branch itself did not seem to increase in size. On the route taken by the geologists the vegetation was entirely that of silicious soil. The limestones were so extensively covered by boulder clay that the calcareous beds had no perceptible influence on the vegetation. Mr. J. Bradley showed specimens of *Mimulus luteus* found on this route.

Bryology.—Mr. C. A. Cheetham writes:—Along the stream side in the Malsis grounds the mosses were not the type expected, large masses of *Hypnum commutatum* and *Weisia verticillata*, both tufa-loving species, showed that a considerable amount of lime was present in the sandstone, and with them was well-grown *Dichodontium pellucidum*, etc. On boulders in the stream there was a delicate form of *Eurhynchium rusciforme*. The mosses of the stream sides and rocks were very different from those of a rough gritstone stream such as at Sawley or the Upper Washburn where Hepatics are the prevailing type of plant. Here the Hepatics were few, or missing, and such plants as *Catharinea crispa*, which delight in the coarse sand débris, were absent.

On the walls *Dicranoweisia cirrhata* was plentiful, with *Webera nutans*, the latter producing the attenuated growths which so easily break off and reproduce the plant vegetatively, and in the fields under trees, a nice growth of *Dicranum Bonjeani* was noted.

The somewhat uncommon *Dicranella cerviculata* grew on the shale when exposed on the stream sides. After crossing over the hill and coming to the limestone quarries the change was striking. *Grimmia apocarpa*, with a little *Encalypta streptocarpa*, *Bryum cappillare* and *Barbula rubella* being the mosses on the rocks, with *Hypnum molluscum*, *H. stellare* and *H. cuspidatum* on the slopes and floor, giving an interesting study in ecology on a small scale.

Geology.—Mr. John Holmes writes:—The party for the geological excursion to Raygill walked up the banks of the stream for about four miles, crossed the ridge to Raygill, and returned down the Lothersdale valley. From its source, just over the county boundary, to its confluence with the Aire, the Glusburn Beck follows the strike of the Sabden Shales. The Kinderscout Grit occupies the slopes of Glusburn Moor and Cowling Hill, while the Middle Grits form the bold escarpment of Earl Crag. Between Glusburn and Cowling, thick deposits of glacial drift occupy the middle of the valley, and the underlying rocks are not seen between Malsis and Gill Bottom. The six-inch map, surveyed in 1848, shows eighteen limekilns on the banks of the streams above Glusburn. All these kilns must have burnt boulders from the drift, as no outcrop of limestone occurs in this valley.

At Glusburn Bridge, a bed of gravel in the middle of the stream was examined and the large proportion of limestone boulders noted. A piece of conglomerate from the basement bed of the Carboniferous Limestone, has recently been found here. Near Malsis, a mass of tufa on the side of the stream was pointed out. These deposits occur in several places, usually in close proximity to boulder clay. Below the junction of Ickornshaw and Gill Becks, a fine series of terraces in the drift indicates the greater power of the former stream. An unusual feature was noticed in

Gill Beck, where a bluish-grey mud was seen oozing up between the boulders in the bed of the stream. A stick was thrust down into this mud to a depth of several feet without meeting with any resistance. Similar places are found in adjoining streams and are known locally as 'quicksands.' At Gill Bottom was the refuse-heap of an old lead working in the Kinderscout Grit. Higher up the stream are sections of shale containing septarian nodules. Near Westfield a fossiliferous bed was found which yielded *Posidoniella laevis*, *P. sulcata* and *Glyphioceras diadema*, the zone fossil of the Sabden Shales. Above Stone Head several other fossiliferous beds were pointed out before the party left the stream to ascend Hawshaw. From the top of the ridge a fine view of the surrounding country was obtained, the glacial overflow channel on Combe Hill being clearly seen on the southern skyline. Descending into Lothersdale, the full thickness of the Pendleside Limestone was seen at Hawshaw Delf, where the beds dip south at a high angle. On the opposite side of the quarry a fine section of the apex of an anticlinal fold was seen. Raygill Quarries were approached by the old road along the top of the anticlinal, where were some old workings. When the party assembled within the quarries, the leader pointed out the position of the bone-cave, the barytes mine and other features. Owing to the absence of weathered surfaces, the effects of pressure, and the detrital matter contained in the limestone, fossils are not easy to find in these beds. After a short time had been devoted to collecting specimens of fluor spar, calcite, barytes and other minerals, the return journey was resumed through the village of Lothersdale and down the right bank of the stream. About half-a-mile below Dale End, and near the junction of Lothersdale and Surgill becks, a large Silurian boulder measuring approximately 9 ft. by 5 ft. by 4 ft. 6 ins., attracted attention. From here, the party crossed the fields to Norwood Lane, and back to headquarters.

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Winter Habit of the larva of Zeuzera pyrini (æsculi).—As *Zeuzera pyrini* is mentioned among the Lepidoptera in the Doncaster Natural History Notes for 1917 (*see* p. 262), I should be interested to hear the experiences of readers of *The Naturalist*, especially from the North, about the habits of the larva during the winter months. During the first week in January, 1917, I found a burrow in some ash wood, which a man was sawing up for me, and on cutting it open and by splitting the wood exposed the larva, rather over one inch long, which was so completely still that I thought it was dead, as it remained so for more than five days although removed to the house and kept in a warm room in its wooden home. Then it began to wake up, and knowing the activity of the species in woodwork, I thought it wisest to end its existence; the wood and burrow I still have. From the appearance of its burrow at the time, I was inclined to think it had been active up to about a month before; but one cannot, of course, lay down any dogma on such a case. It would be interesting to know from others who have found larvæ in winter, whether they were active or not, and whether the winter at the time was severe or mild. I cannot find any information in books about these last-mentioned points.—F. D. Welch, M.R.C.S., Hartley, Kent.

FIELD NOTES.

BIRDS.

The Corncrake Puzzle.—With regard to Mr. Booth's note on the Corncrake, can it be that the species has altered its habits as regards voice? The continual craking must attract its enemies, mammalian and avine, and the modern hay-cutting machines must disturb birds at nesting time much more than in the former centuries, and it seems therefore possible that the 'instinct of self-preservation' has suggested to these birds to alter their behaviour. If so, perhaps it is as well! When living in Herefordshire in 1902, a nest was found just at hatching-out stage, in a field at Burghill, one egg being cut into by the scythe, and although I and others used to pass along a path through the field it was never suspected that a pair of Corncrakes was nesting so close. Although left, both birds deserted the nest.—FRED. D. WELCH, M.R.C.S., Hartley, Kent.

The Corncrake Puzzle.—Mr. Booth's note was of extreme interest, and bearing upon it and Mr. Welch's query, it may not be uninteresting to record the behaviour of a pair of birds at Harrogate, this season. The birds took up their abode in a meadow, about two hundred yards north of my house, were first heard on the 14th May, and for about a week the craking was continuous. After a week had elapsed the bird was seldom heard, only once or twice, when I wandered about on the outside edges of the meadow and apparently unexpectedly approached one, when it appeared to give, to me, a few warning 'crakes.' Owing to an acute attack of sciatica, I have been unable to walk much this summer, and consequently paid more attention to these birds than I probably otherwise should have done. As a result of my observations, I came to the conclusion that when nesting commenced, the calling practically ceased. From the middle of June to the middle of July I did not hear the birds at all, though constantly walking round the field; I did not attempt to seek the nest, except on the outskirts. I therefore thought that, for some reason or other, the birds had left the neighbourhood, but on July 16th, the 'craking' re-commenced, but in a rough field at the back of my house, direct east. Subsequent investigation showed that a brood had been hatched in the first field, and they were no doubt taken, before any signs of grass-cutting, into the other field. To reach there they had to be taken across a brook and three fields, this was quite evidently the case, as there had been no signs of the birds in this field previous to July 16th. The 'craking' continued for about a fortnight and then ceased altogether, and I have not since heard them. This behaviour is quite at variance with the experience I have previously

had with birds nesting near my house. The birds would no doubt desert the nest referred to by Mr. Welch, owing to one of the eggs being broken, as otherwise, especially if a little cover was left, the probabilities are that they would not have done so. Several cases have come under my own observation when birds have stuck to the nest and brought off their brood after the reaper had laid bare the surrounding ground.—R. FORTUNE.

Thrush with White Tail-tip.—On August 12th, I noticed a white variety of Song Thrush, with a peculiar distribution of the abnormal white which completely covered the tip of its tail (for about an inch), all other parts of the plumage being normal. It was fully adult, judging from its size, and was very wary, presumably having been shot at by someone ; but after some difficulty I got several good views of it. The white tail-tip looked very curious when flying. The only other case I can remember to have seen ' in the flesh ' was one which lived from about 1897 to 1903, in North Cheshire, and was usually midway between Mottram and Broadbottom villages. This latter bird had several white primaries on each wing, and they always returned the same after each moult. White varieties and complete albinism are undoubtedly due to defective developments ; but why so much commoner in Blackbird than Thrush ?—FRED. D. WELCH, Hartley, Kent.

Kestrel ' flying-down ' a Song Thrush.—In June, 1914, a case in which a Kestrel deliberately ' flew-down ' a Song Thrush was observed by me, the chase being carried out at a level of from four to five feet from the ground the whole time ; the distance covered was about forty yards by each bird, but as both were travelling at top speed when first seen by me, it is probable that they had flown much further, but a hedge prevented me seeing the first part of the flight. The pace of the Kestrel can only be described as terrific. Comparing this with two cases of the usual downward dash or stoop, seen near, one a Sparrow Hawk in North Cheshire about 1902, the other a Kestrel seen here on July 7th of this year (possibly the same bird), it seemed to me that when ' flying-down ' a bird, a Hawk travels considerably faster. I am quite certain it was a Kestrel, because, after catching the unfortunate Thrush, it dashed headlong into some wire netting round a fowl run, unable to stop owing to the speed it was going, and presumably got partly stunned judging by the way it clambered up the netting with difficulty, and finally sat on the top for several minutes. As I approached to within fifteen feet of it, its whole plumage was easily seen in the broad sunshine. It was the most extraordinary bird episode I have yet seen.—FRED. D. WELCH.

NEUROPTERA.

Coniopteryx aleyrodiformis at Huddersfield.—On June 11th last, I was pleased to beat out of an oak in Lepton Wood, Huddersfield, a few specimens of the pretty little *Coniopteryx aleyrodiformis*, and on the 29th of the same month, more specimens from both oak and hawthorn in Farnley Mill Wood, in the same district. In Yorkshire the species has only previously been recorded from the Cleveland district, by Dr. J. W. H. Harrison.—Geo. T. Porritt, Dalton, Huddersfield.

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ENTOMOLOGY.

Euchelia jacobææ in North West Yorkshire.—On the 30th July I was surprised to find one larva of *Euchelia jacobææ* feeding upon ragwort on Blackhills. I subsequently examined more ragwort in this locality, but found no more larvæ. I have never met with the imago yet in this district, and I believe it has not been recorded for North West Yorkshire.—E. P. Butterfield.

Euchelia jacobææ near Bradford.—An imago of this species was taken at Shipley Glen in June 1910, by Mr. F. Booth, who kindly gave the specimen to me.—J. W. Carter.

Zeuzera æsculi in North West Yorkshire.—On the 3rd August an insect was brought to me which had been picked up in our Council School playground, and had evidently been trodden upon by the children, as its body was quite flat and in a very mutilated condition. It was a Wood Leopard Moth, which has not, I believe, been recorded previously for North West Yorkshire, according to Porritt's list, 2nd edition, 1904. —E. P. Butterfield.

Hemiptera-Homoptera in East Yorkshire.—On August 1st, I had the pleasure of a couple of hours' collecting on Skipwith Common in company with Dr. W. J. Fordham, of Bubwith, and made a search for two fairly recent additions to our British list of heath-frequenting species. The scale-insect *Eriococcus devoniensis* Green was fairly common on *Erica tetralix*; this was originally described from South Devon, but has been recorded from other localities also, among which we may note North Yorkshire (Dr. J. W. H. Harrison). A more interesting discovery was the Aleyrodid *Tetralicia ericae* Harrison. This has, so far as I know, been taken only in a very limited area in county Durham, where, with its discoverer, I have taken it. At Skipwith it occurred in smaller or larger numbers on every tuft of *Erica* on which search was made, in one case over a score being seen in one spider-web. This is a new county record, and the former is a new record for vice-county 61.—Geo. B. Walsh.

MAMMALS.

Pine Marten.—It may interest Mr. Forrest and others to know that when looking through the Pine Marten skins in the British Museum about eighteen months ago, I found one labelled 'probably Northern Norway' (the exact locality from which it came being never known with certainty, so I understood). It was of a dirty-whitish coloration, and at a distance of a few feet it looked like a 'white variety' (abnormal), but on careful examination the tips of some hairs were seen to be brownish, and it therefore seemed to me to point to a well-marked seasonal change of coloration in the locality it came from. It was far paler than any other European Marten I have seen. In expressing the above opinion, I should make it clear that I have no idea what Mr. O. Thomas's opinion may be about its coloration. A specimen of Marten which lived in the London Gardens about 1904 to 1907, and which got finally named Beech Marten (from Arctic Russia according to the last label I saw), grew paler in its long winter coat, but whether its species name was confirmed after it died by its cranial and dental characters I cannot say. When it first arrived its throat seemed to me to have a yellowish tinge (but it lost this as it grew older), and when young it looked like a Pine. It was bolder than most Beech Martens; not so shy. Pine Martens from North of England, exhibited in London, grew rather paler in the throat at the beginning of winter, but as only two were kept under observation regularly, I cannot say whether this applies to British specimens as a whole. I am inclined to think a mammal I saw in a wood near here in the spring of 1912 was a Marten (Pine), but as it disappeared quickly am not certain, but its run was similar.—Fred. D. Welch, M.R.C.S., Hartley, Kent.

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We have received the following letter from Mr. Johnson Wilkinson, of the Yorkshire Wild Birds and Eggs Protection Committee:—'In reply to the remarks in your "Notes and Comments" for August, on the destruction of Sea Birds' Eggs on Bempton Cliffs, notice was at once taken in the matter with the result that the Commanding Officer of the district went thoroughly into the question and finds that no Officer of the Hornsea Seaplane Station was guilty of doing such an insane thing. There are other units with machine guns fitted to their aeroplanes. The shooting will not occur again. Since writing we find the culprit was not an Englishman.'

Mary Hungerford writes to one of the London dailies, in the hope that her letter will help the cuckoo 'to retrieve his character of a callous parent,' though we fancy 'the tiniest thing in baby birds' was anything but a child affectionately following its papa. She says:—'As I was sitting quietly [!] in a garden I saw one flying from tree top to tree top with the tiniest thing in baby birds "in tow," the two flying a few inches apart—baby doing its best with its tiny wings to keep pace with father. The parent bird was cuckooing wildly as it flew, and it also made a hissing noise, which no doubt is the correct baby language used in cuckoo-land. I was very interested in the parental devotion shown by this much-libelled bird.'

NEWS FROM THE MAGAZINES, etc.

Dr. W. E. Collinge writes on 'The Value of Insectivorous Birds' in *Nature* for July 25th.

The death is announced of Dr. R. O. Cunningham, Professor of Geology and Natural History, Belfast.

A recent number of *Country Life* contains an interesting article on Duck Decoys in Holland, by Mr. Riley Fortune.

The grants made for scientific research during 1919, by the British Association for the Advancement of Science, amount to £268.

'*Uronema elongatum*: a new freshwater member of the Ulotrichaceae,' by William J. Hodgetts, appears in *The New Phytologist* for July.

R. S. Bagnall and J. W. H. Harrison write 'On some *Cynipid* Oak-Galls new to the British Fauna' in the *Entomologist's Monthly Magazine* for August.

The Lancashire and Cheshire Naturalist for July contains an account of the Fungus Flora of Lancashire, by H. J. Wheldon, and notes on Myriapoda, etc.

The Transactions and Journal of the Eastbourne Natural History, etc., Society, No. 21, Vol. VIII., contain 'Notes Towards a History of the Society,' 1867-1917.

The Annual Report and Proceedings of the Belfast Naturalists' Field Club, Vol. VII., part 5, contains an appendix dealing with 'The Wood-Lice of Ulster,' by H. N. Foster.

Mr. W. R. Butterfield, of the Hastings Museum, who is evidently an authority on the subject, writes on Love-spoons, Spooning and Symbols of Affection, in *The Connoisseur* for August.

Prof. J. W. Gregory's address on 'The Geology of Phosphates and their Bearing on the Conservation of Mineral Resources' appears in the *Transactions of the Geological Society of Glasgow*, Vol. XVI., part 2.

In *The Geological Magazine* for August, in the 'Eminent Living Geologists' series, is an account of the work of G. W. Lamplugh, a past President of the Yorkshire Naturalists' Union, together with a Portrait and a list of his books and memoirs.

Ignorance fortunately is always dispelled by steady pressure. Mr. Owen Seaman's scathing verses on the Treasury, aided by colonial protests, has at last succeeded in forcing open the doors of the British Museum, and the treasures of the nation will no longer be locked from the children of the empire, by official stupidity.

British Birds for August contains a paper on 'the Heather and Grouse Disease,' by J. Dugald Macintire. The same journal contains notes on Snow Finches in Sussex; 'only three specimens of these species have previously been obtained [!], one from Sussex and two from Kent'; Large Wall-Creeper, from Sussex, which is the sixth specimen from England and the fourth from Sussex. All the specimens were duly shot and 'examined in the flesh.'

Among the additions recently made to the Manchester Museum are the valuable collections of British butterflies, moths and beetles, and a number of important entomological books which belonged to the late Joseph Sidebotham, presented by Mr. J. W. Sidebotham; a number of rare insects and other animals collected when on military duty in German East Africa, presented by Captain A. G. Wilkins, R.A.M.C. Mr. Edward Melland has handed over his specimens of New Zealand birds and their eggs, many of which are now rare or extinct. This collection includes a good range of Kiwis and most of the native ducks. The Committee has acquired the 'Fred Enock' myramids, a large number of beautifully mounted typical specimens of a group of the hymenoptera that are parasitic upon the eggs of leaf-hoppers, plant bugs and aphids, insects destructive to food plants, and a valuable collection of ammonites from Mr. S. S. Buckman, many of which are type specimens.

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LONDON : A. BROWN & SONS, LTD., 5 Farringdon Avenue, E.C. 4.

AND AT HULL & YORK.

Printed at BROWNS' SAVILE PRESS, 40, George Street, Hull, and published by A. BROWN & SONS, Limited. at 5 Farringdon Avenue, in the City of London.
September 1st, 1918.

OCT. 1918. No. 741
(No. 515 of current series.)

THE NATURALIST

A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY
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THE MUSEUMS, HULL;
AND
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TECHNICAL COLLEGE, HUDDERSFIELD.
WITH THE ASSISTANCE AS REFERREES IN SPECIAL DEPARTMENTS OF
J. GILBERT BAKER, F.R.S. F.L.S., GEO. T. PORRITT, F.L.S., F.E.S.,
Prof. P. F. KENDALL, M.Sc., F.G.S., JOHN W. TAYLOR, M.Sc.,
RILEY FORTUNE, F.Z.S.

Smithsonian Institution
JUN 24 1920
National Museum

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LONDON:
A. BROWN & SONS, LIMITED, 5, FARRINGDON AVENUE, E.C. 4.
And at HULL and YORK.

Printers and Publishers to the Y.N.U.

Prepaid Subscription 6/6 per annum, post free.

YORKSHIRE NATURALISTS' UNION.

ANNUAL MEETING OF THE ENTOMOLOGICAL SECTION.

President: G. T. PORRITT, Esq., F.L.S., F.E.S.

Two meetings will be held in the Museum, York, on **Saturday, October 26th, 1918.** Afternoon meeting at 3-15 p.m., to consider and pass the Sectional Reports for 1918, and to elect officers for 1919.

At 6 p.m. a further meeting will be held, at which entomological topics will be discussed.

Exhibits of all orders of insects are invited, and it is important that exhibitors should attach their names to their exhibits and label specimens with names and data. The secretaries earnestly solicit notes and records made during the season on entomological subjects in the county.

Members and associates of the Union are cordially invited.

Secretaries —

LEPIDOPTERA.—H. H. Corbett, M.R.C.S., Doncaster, and B. Morley, Skelmanthorpe.

HYMENOPTERA, HEMIPTERA and DIPTERA.—J. F. Musham, Selby.

NEUROPTERA, ORTHOPTERA and TRICHOPTERA.—G. T. Porritt, F.L.S., Huddersfield.

COLEOPTERA.—W. J. Fordham, M.R.C.S., Bubwith.

B. MORLEY,
Sectional Secretary,
Skelmanthorpe.

BOTANICAL SECTION.

The Botancial Section will meet on OCTOBER 5th, at 3-30 p.m., at the Co-operative Naturalists' Room, Leeds Co-operative Society, Albion Street, Leeds.

BUSINESS.—Appointment of Officials and Committees, and to discuss reports of Botanical, Bryological and Survey Committees.

Papers of botanical interest, including one on "Distribution of Pinus in Yorkshire Peats," by Miss Elsie D. Whitaker, will be read; and members are asked to bring any interesting exhibits.

C. A. CHEETHAM, *Hon. Sec.*

GEOLOGICAL SECTION.

President: E. HAWKESWORTH, Esq.

A Meeting will be held in the Library of the Museum, York (by kind permission of the Yorkshire Philosophical Society), on SATURDAY, OCTOBER 19TH, 1918, at 3-30 p.m.

BUSINESS.—To consider and pass sectional reports for 1918, and to elect officers for 1919.

To discuss the future work of the various Committees and other matters.

Short papers will be given by several members of the Section.

Any Member or Associate of the Yorkshire Naturalists' Union is invited to attend and to bring notes, specimens, etc., and is requested to bring forward matters of interest connected with the work of the Section and to take part in any discussion. Will officials of Affiliated Societies kindly notify their Members?

Any further particulars from

J. HOLMES (*Hon. Sec.*),
Crosshills, Keighley.

JUN 24 1920
National Museum

NOTES AND COMMENTS.

RATS AND MICE.

For the low price of 1s. the British Museum (Natural History) has issued No. 8 of its Economic Series, dealing with 'Rats and Mice as Enemies of Mankind' (63 pp.). As the author is M. A. C. Hinton we are not likely to be able to find anything but of the best. There are excellent plates showing the characteristic features of the Black Rat and Brown Rat, and illustrations of parts of voles and mice, etc. Our readers will find the pamphlet most useful.

YORKSHIRE TYPE AMMONITES.

We are glad to observe the re-appearance of Mr. Buckman's Monograph on Yorkshire Type Ammonites, two parts of which

A. semicostatus.

have recently been published, and we trust that this valuable work will soon be completed. Part 16, just to hand, contains a description of *A. semicostatus*, *A. rotifer*, *A. bifrons*, *A. rugosus* and *A. vertumnus*, which are admirably illustrated by plates from photographs by Mr. J. W. Tutcher. We are able to reproduce one of the smaller illustrations herewith.

NATURE A-MUSINGS.

Punch gives some 'Nature Musings' in his impression of August 21st :—'August 15th. This is a halcyon day, and to measure its charms aright one should spend it on the banks of a river . . . Suddenly a kingfisher shoots across the pool, like a living jewel, snaps an insect from the glassy surface and shoots on . . . No trout are rising, but a water-rat plops into the stream, and at intervals the scuffle of dab-chicks is heard . . . We miss the cuckoo's 'two-fold shout,' but cuckoos are rarely,

if ever, heard in August, even by writers of Nature Notes. A cow moos gently in an adjoining field. The day is built up of just such little incidents, not exactly soul-shaking, but none the less infinitely helpful in supplying useful grist to the mill of the Summer Diarist.'

HUDDERSFIELD NATURALISTS.

We are glad to find that some of our Yorkshire scientific societies are not only able to carry on their work under the present conditions, but are also able to publish the results of their work. One of the oldest of these, the Huddersfield Naturalist, etc., Society, has just issued its 67th Annual Report (14 pp.), which contains a useful record of the Society's many activities. We notice that the valuable relics from a British tumulus on Pule Hill have been presented to the town, as have also the geological specimens and books collected by the late Wm. Simpson, of Catterall Hall, Settle. There are reports (general) and photography, by M. C. Whiteley; Natural History and Entomology, by C. Mosley; Antiquities, by C. Wood; Library and Ornithology, by E. Fisher; Botany, by W. E. L. Wattam; Microscopy, by G. H. Charlesworth; and Geology, by T. W. Woodhead.

NATURAL GAS.

From the last-named report we learn that: 'While boring for water at Prospect Mills, Longwood, owned by Messrs. Joseph Hoyle and Son, a large supply of marsh gas was discovered. The boring commenced in the sandy shales below the Rough Rock, and in these shales excellent specimens of the leaves of *Cordaites* were found. On June 8th, 1918, while boring through the compact grit below, at a depth of 186 feet, the gas escaped under great pressure, and taking fire, did serious damage to the roof of the shed covering the boring apparatus. Only after considerable effort was the flame extinguished by plugging the bore hole with soil. The boring operations were suspended and the gas was conducted to the boilerhouse by means of pipes, and for three weeks two fires were fed with the supply before any considerable diminution of pressure was observed. Since then the supply has fallen off very much and instructions were given to continue boring, though on August 1st the gas was still escaping. A large supply of gas was not expected in these beds, as the coal seams and carbonaceous shales are insignificent. So far as I can ascertain, this is the largest supply of gas met with in this country in the Millstone Grit Series.'

RED-BREASTED FLYCATCHER NESTING.

The Right Rev. Arnold H. Mathew writes to *Bird Notes and News* (Vol. VIII., No. 2) from Walmer, May 12th: 'A rare visitor to England has successfully brought off a nest of

young in my garden this spring, viz., the Red-breasted Flycatcher (*Muscicarpa parva*). I have not previously heard of the nesting of this species in this country, and I think the specimens that have been shot by collectors have usually appeared at the end of summer. The bird is very like an undersized Robin, but the breast feathers are of a much brighter orange-chestnut and the outer tail-feathers are white tipped with black. The nest, which is said to be found usually in beech-trees, and to be placed on a branch against the trunk or in a hole, was in this instance at the end of the branch of a fir-tree, farthest from the trunk, and appeared to be an old nest relined and repaired. Unfortunately, after the young birds had flown, a strong wing blew the nest into the adjoining road, where it was destroyed before I could recover it.' To this the editor adds: 'This very Robin-like little Flycatcher is scarcely bigger than the Blue Tit, and its song is said by Dresser to resemble that of the Wood-Wren. Its young are not generally hatched until June, but there is no previous record for Great Britain.' The last sentence seems sufficient to draw attention to the record in our pages, but if the young were hatched and away by May 12th, it makes us wish that an ornithologist of some standing had confirmed the record.

LANCASHIRE NATURALISTS.

The Lancashire and Cheshire Naturalist for August is an exceptionally good number, and the contents principally refer to the two counties named in the title. Among the papers referring to these counties are 'Oligochaet Worms,' by Rev. H. Friend; Aphidae,' by A. W. R. Roberts; 'Fungus Flora,' by H. J. Wheldon; 'Moorland Hepatics,' by W. H. Pearson; 'Plant Parasites,' by W. A. Lee; Galls on *Carex stricta*,' by A. A. Dallman; and 'Notes on Manx Flora,' by J. A. Wheldon.

BRITISH BIRDS.

Besides 'Some Breeding Habits of the Sparrow-Hawk' (illustrated), by J. H. Owen, *British Birds* for September contains a record of a Meadow-Bunting shot in Sussex in April, 1915, duly 'examined in the flesh,' and is the sixth record for England (five being in Sussex!); and a solitary Sandpiper, shot in Sussex in May, 1916, duly 'examined in the flesh,' and is the seventh recorded British specimen and the second for Sussex. What we cannot understand is why these presumably valuable details should have been withheld from the scientific world for all these years. If the author of these rare Sussex records has a sheaf of them to trot out at respectable intervals, one would suggest that the editor of *British Birds* gives us a special 'shot in Sussex and examined in the flesh' supplement, and let us get it over in one dose.

OLD SCIENTIFIC MAGAZINES*: THE ORNITHOLOGIST.

In March, 1896 appeared No. 1 of 'The Ornithologist, a monthly Magazine of Ornithology and Oology. Edited by H. Kirke Swann,' with six assistants well known in the Ornithological world. It was printed by John Bale and Sons, published by Eliot Stock; 8vo, 20 pages, and was sold at 6d. The publication was illustrated, and in many ways it had characters in common with the later publication covering the same ground, namely *British Birds*. The Magazine appeared monthly until October, occasionally with extra pages, and then the part 'Nos. 9-12,' covering the period November to February, 1899, appeared, price 2/-, which seems to have been the last of this interesting periodical that was published, as in the Preface the editors 'regret that with the completion of the first volume the publication of the Ornithologist is suspended.' I am indebted to Mr. Kirke Swann for a set of this interesting Magazine.

ANIMAL WORLD.

In addition to the series described in *The Naturalist* for 1917, p. 355, the Royal Society of Prevention of Cruelty to Animals published an earlier series entitled 'The Animal World, a Monthly Advocate of Humanity.' This measured 10 in. × 14½ in., consisted of 16 pages, and was sold at 2d. It commenced in 1869 in this form, and was published without interruption till the end of 1905, when the new series commenced. The Magazine was well illustrated, and printed in double columns.

SCIENTIFIC ENQUIRER.

Referring to the note in *The Naturalist* for December, p. 390, through the kindness of Mr. F. W. Mills, I have now obtained a complete set of this publication, from which it is evident that the editor had originally decided to cease publication from the second volume, which consisted of 242 pages.

THE SCIENTIFIC NEWS.

No. 1, Vol. I. (New Series)† of *The Scientific News for General Readers* was published on January 6th, 1888, was printed in double columns, 4to, and sold at 3d. weekly, each part containing 24 pages. The first Volume was completed in June, 1888, with a total of 624 pages. Vol. II., from July to December 28th, 1888 (664 pages) completed this series, as we read on page 641 that 'A year's experience has shown that, though the number of readers has increased, the rate of increase has not been sufficient to justify the continuance of the Journal.'

* Continued from *The Naturalist* for Dec. 1917, p. 391.

† In the 'Notices' at the end of each issue of the *New Series*, 'Vol. I., *First Series*,' bound in cloth, is offered for sale at 7/6; the title-page, index, and binding cases for this Vol. I. are also offered.

NOTE ON THE SOIL BELOW THE PEAT ON MOUGHTON FELL.

A. GILLIGAN, D.Sc., F.G.S.

The source of origin of the siliceous soil which occurs below this peat is discussed in the report of the excursion of the Yorkshire Naturalists' Union to the Settle district, and is attributed to ice-borne material washed in by melt-water. I propose here to give the results of the mineralogical analysis.

Immediately beneath the peat the soil is grey in colour, full of rootlets and about two inches in thickness. Next comes a layer of 'iron pan' about a quarter of an inch in thickness, and below this is a very ferruginous sandy bed which has been proved to a depth of four feet and is possibly much greater in the hollows. Some of this sandy bed was taken and after being broken up between the fingers, was dried for twelve hours at 105° C. Of this, 200 grams were taken and thoroughly sieved with the following results :—

$> \frac{1}{10}$ in. = 1·600 grms. ; $< \frac{1}{10}$ in. $> \frac{1}{30}$ in. = 2·850 grms.
$< \frac{1}{30}$ in. $> \frac{1}{60}$ in. = 5·850 gms. ; $< \frac{1}{60}$ in. $> \frac{1}{90}$ in. = 12·255 grms.
$< \frac{1}{90}$ in. = 177·490 grms. (by difference).

All the separations were highly ferruginous and had to be treated with hot dilute hydrochloric acid to remove the iron oxide. The addition of the acid produced not the slightest trace of effervescence, proving the absence of carbonates. The cleaned separations of the coarser material were examined in bulk with a binocular mineralogical microscope, when the rock fragments and minerals in the various grades were found to be as follows :—

$> \frac{1}{10}$ in.—felspathic sandstone and grit, ironstone, chert, with some fragments of slaty appearance.

$< \frac{1}{10}$ in. $> \frac{1}{30}$ in.—felspathic sandstone, quartz, chert, with a few fragments of ironstone.

$< \frac{1}{30}$ in. $> \frac{1}{60}$ in.—quartz (greatly preponderating) felspar, mica. Very few chert and ironstone fragments.

Some of the cleaned material $< \frac{1}{60}$ in. was mounted in canada balsam and examined in the usual way with ordinary and polarised light.

That which was $< \frac{1}{60}$ in. $> \frac{1}{90}$ in. was almost entirely quartz with a little felspar, mica and a few grains of chert. Heavy minerals (given later) were also present in fair quantity.

The quartz was subangular, having numerous inclusions of regular, irregular and acicular types. The regular inclusions noted include *tourmaline*, *zircon* and *rutile*.

The irregular inclusions appear frequently arranged in rows and some of them contain liquid with moveable bubbles.

Inclusions of the acicular type, probably *rutile*, were not

so common as the others. Many of the grains showed clear secondary quartz on the borders. No perfectly clear grains have been seen.

The felspar was clouded and the type could not be determined. The mica was almost entirely muscovite, though a few flakes of green mica also occur.

Material $< \frac{1}{90}$ in. only differs from that described above in having a much greater proportion of heavy minerals present and the somewhat more pronounced angularity of the quartz grains.

Heavy Minerals.—These were separated with a Sollas bottle and Thoulet's Solution having a specific gravity of 2·80.

Zircons make up over 90 per cent. of the separation, with *tourmaline* and *rutile* next in order and about equal in quantity. The rest was made up of *ilmenite, limonite, magnetite, anatase, epidote, garnet, green hornblende, sphene* and *monazite.*

The whole assemblage of rock fragments and mineral species is such as could have been derived from the grits, sandstones and shales of the Carboniferous System, with some additions from the older rocks of the district, the slaty fragments being evidence of this. It is not such as could have been yielded by the decomposition of limestones. Some of the separation $< \frac{1}{90}$ in. was washed by decantation to free it from the still finer particles and the washings allowed to settle for 24 hours, in which time the liquid had almost cleared itself being only slightly turbid. An examination of these washings in the same manner as that described above proved it to be simply a case of finer sub-division—in short it was rock flour not clay, the mineral species being readily determined with a high magnification. For comparison with this, some of the material found in the crevices of the limestone round Moughton Fell—which I have elsewhere suggested had been washed out of the coarser sand—was examined. This also proved, as expected, to be rock flour, with only a slight admixture of clayey particles.

Another interesting comparison was also made. In some of the chambers which open out from the bottom of Gaping Ghyll large accumulations of a fine earthy substance are found. Some of this I obtained when down the Ghyll some years ago. and subjecting this to the same treatment as that described above found it to be similar in all respects (except that it contained very little ferruginous material) to that in the crevices and the washings. Now the surface of the land round Gaping Ghyll is covered with glacial drift, and it would seem that the rock flour found in these chambers has been yielded by the resorting and washing of such drift which is chiefly of a gravelly or sandy nature.

The explanation of the layer of 'iron pan' is not difficult

when it was seen how very ferruginous is the sandy deposit below it. The iron, in whatever form it was originally present, would be converted into soluble salts by waters containing organic acids, carbon dioxide, etc., and these iron-bearing solutions rising from below by capillary action would eventually reach the zone where they would meet free oxygen, and so be converted into the insoluble hydrated oxides such as limonite or some closely allied mineral.

It would appear that the ' pan ' commenced to form as soon as conditions were favourable for establishment of the earliest vegetation in the swamp and has not been penetrated to any extent by the rootlets of the later vegetation. The soil above the pan is of the same mineralogical constitution as that below but, as would be expected, it has been bleached by organic acids from the peat above.

My thanks are due to Mr. C. Cheetham, under whose guidance I examined the area and who kindly provided me with the sample for this analysis.

——: o :——

FORMER STATUS OF THE COMMON STARLING IN BRITAIN.

E. P. BUTTERFIELD.

Whatever differences of opinion there may be among naturalists regarding the status of the Starling in the earlier decades of the last century, more especially between the years 1835 and 1845, it is quite certain that many, if indeed any, could be found to deny its great increase as a breeding species as compared with former years. In this district (Wilsden), ever since my boyhood days, covering a period from the sixties down to the present time, the Starling has been a common, if not an abundant species ; although like many other birds, it has varied in its numbers in certain years. It is when naturalists begin to discuss its status in the above-mentioned years that differences of opinion begin to develope. Many assert that the Starling was unknown in many parts of Britain either as a breeding species or even as an immigrant prior to the thirties of the last century. It may be that the Starling formerly was more local than it is at the present, but many statements regarding its first appearance in certain localities should not be accepted without further authentication. An old man died in Wilsden a few years ago, who used to assert most positively that he remembered the first appearance of the Starling in Wilsden, which was regarded by the inhabitants with much curiosity. This incident he would often recite with much circumstantiality to his friends ; nevertheless, I have always thought there might have been some element

of doubt in the matter, not that I would insinuate that the man was untruthful, but that he might have been mistaken—and it is somewhat singular that this observation is not confirmed by many other old men in this or other adjoining towns. In 'The Birds of Yorkshire,' page 217, it is stated that a Mr. Ford, of Caistor, writing in *The Field*, 20th October, 1888, remarks that a friend of his told him he recollected the first pair of Starlings that came to Swaledale, at Low Row, a few years after they made their way to Summerside, then to Muker, Keld and the head of the dale. If the Starling was so local in its distribution in Yorkshire, it is somewhat curious that Thomas Allis, writing of this species in 1844, should make the statement that it was 'universally common'—and the Rev. L. Jenyns, in his work published in 1835, mentions the Starling as a 'plentiful and widely-dispersed species.' Robert Mudie, in his 'Feathered Tribes of the British Islands' (1834), states that the Starling is found 'abundantly in all the lower parts of Britain and in the most northerly of the Island.' In Charles Waterton's Essays (1845), sixth edition, he gives twenty-four pairs of Starlings as having built in his old ivy-covered tower. Many other records could be given if necessary, to prove that the Starling was a widely-breeding species in England during the years 1835-50. A letter written to the late J. A. Harvie Brown by the late Duke of Argyle, dated 19th January, 1894, states: 'I never saw a Starling till I went to England in 1836. I still recollect the great interest with which I saw the bird for the first time at the Posting Inn, at Northallerton, in Yorkshire.' We must not, however, infer from this letter that the Starling was then an unknown or even a rare bird in Scotland. Indeed, I am not quite sure whether the same mistake has not been made regarding the status of the Starling in former years in Scotland as in England. It is said that the bird first appeared in East Ross in 1865, and another observer has stated that between the years 1845 and 1848, a most curious bird which was taken to be a Starling visited his stack-yard at Inverurie, this being the first appearance of this bird in that district. Many Highlanders even now assert that the Starling has only within comparatively recent years made its appearance in the Highlands, but St. John, in his 'Tour in Sutherland,' in 1849, writes:—'The Common Starling is widely distributed. The greatest number that I saw in any one place was on the Island of Kanda'; and writing in *The Zoologist*, in 1848, on the birds of the Northern Districts of Inverness-shire, A. Hepburn says, 'The Starling was widely distributed over the cultivated grounds.' In *The Naturalist* for July, 1853 (p. 220), Mr. John Longmuir writes, 'From the statement with regard to the occurrence of the bird (Starling) in our county, one would be led to suppose that it is a rare

visitor in Aberdeenshire. This is, however, not the case. At certain seasons of the year it is very common in the neighbourhood of this city, where it frequently congregates in large numbers, especially about the pools on the links of Old Aberdeen, and Mr. Mitchell mentions to me, that on more than one occasion he has observed immense flocks near the same locality. It breeds in great numbers in various parts of our county.' On the other hand, Mr. James Taylor, in *The Naturalist* for 1853, writes :—' Although common in the Outer Hebrides and other parts of Scotland, it is rather rare with us (Aberdeenshire), I only remember seeing a pair in 1845, *which I shot*'' As regards Ireland, the Starling, according to some ornithologists, is to be regarded as a comparatively recent addition to its avifauna, but how is this to be reconciled with the fact that in *The Zoologist* for 1848 is a record of the finding of a singular nesting-place of the Starling in or near Belfast ; and in *The Naturalist* a correspondent records, in 1852, seeing half a dozen nests within a radius of twenty yards in Dublin. Many other quotations might be given of the distribution of the Starling about the time when this species was said to be rare or unknown in certain localities in Britain, all of which point to the fact of it being much more widely dispersed a species than would be inferred from traditional statements. It would indeed be a singular feature in the economy of the Starling if this localism in its distribution could be clearly established, and it is to be feared, as far as the district is concerned, the traditional belief that this species first made its appearance here (Wilsden) about the decade between 1835 and 1845, is, to say the least, very doubtful. It is somewhat singular that White does not more frequently allude to this species in his letters to his friends. He speaks of Lapwings and Starlings sometimes associating together, but beyond this he is very reticent.

——: o :——

SCENT GLANDS IN LEPIDOPTERA : THEIR CHARACTER AND FUNCTIONS.

J. W. TAYLOR, M.Sc.

I have perused with considerable interest the recent communications of your valued correspondents, Mr. B. Morley and Mr. G. T. Porritt, on the nature and methods of Sexual Allurements in Lepidoptera, and although much light has been shed upon the subject, yet, as the topic is an interesting one, I trust I may be allowed to add a few comments thereto.

I gather from Mr. Morley's remarks that he doubts the presence of the scent glands in Lepidoptera and consequently the existence of any sexually attractive emanations there-

1918 Oct. 1.

from, but possibly it has escaped his notice that Dr. Dixey, of Oxford, one of our most distinguished Lepidopterists and the possessor of one of the finest collections of *Pieridæ* extant, contributed an excellent report upon this particular subject to the Meeting of the British Association in 1914, an abstract of which appeared in the issue of *Nature* for December 10th, 1914.

In this communication Dr. Dixey lays special stress on the undoubted presence and glandular character of certain specialized scales found on the bodies, limbs and wings of butterflies in both sexes, but certain forms of them, as the 'Plume Scales' of the *Pieridæ* and *Nymphalidæ*, which often afford valuable specific characters, have been found only in the male sex. In some groups a special adaptation exists (as is the case with the costal folds of the forewing in many *Hesperidæ* or Skippers) to conserve and control the odoriferous emanations which can thus be emitted at pleasure for sexual attraction and recognition, or the scent-distributing scales may become aggregated together and placed on that part of the fore or hind wings which is covered in the resting position, as in many *Pierids*, and certain *Satyrids* and *Nymphalids*.

This diffusion of scent or pleasant odours by butterflies was first observed in Brazil, where certain species were remarked to be as fragrant as the choicest flowers, the fragrance resembling that of the Stephanotis, Gorse, Sandal-wood and other natural perfumes. These enticing odours were eventually found to be not confined to South American species, but to be a wide-spread feature in the biology of the group and to emanate from certain glandular scales which, though occurring in other positions, are very frequently placed at the anterior margin of the wings, and usually, though far from invariably, confined to the male sex.

A distinctive and characteristic perfume is probably secreted by each species, and that this is so is supported by the records that the males of the Large Garden White Butterfly, *Pieris brassicæ*, diffuse a faint yet delicious scent of Balsam or Lemon; those of the Small White *Pieris rapæ* shed an aroma of Thyme, and from the Green-veined White *Pieris napi* there emanates a faint but delightfully odoriferous perfume resembling that of the Lemon-Verbena. Other butterflies, according to their kind, secrete other odours as Sweetbrier, Honeysuckle, and other choice perfumes, which are sometimes so strong as to be perceptible to the blunter senses of mankind.

The faculty of secreting and diffusing attractive odours is, however, not confined to butterflies, but is also shared by moths, and the odours they emit are probably as pleasant, and the position of the glandular areas as diverse as in butterflies, for we find that in the primitive group *Hepialidæ* or Ghost

Moths these scent glands are developed upon the hind legs, though more generally they are placed upon the wings, and sometimes covered with brightly-coloured tufts or little patches of hair, while the odour exhaled by the Convolvulus Hawk Moth, *Sphinx convolvuli*, is of a pleasantly fragrant musky character.

Although in butterflies it is usually the male which supplies the attractive force, it is otherwise in those species or genera of moths in which the females are apterous or large-bodied and lethargic. In such cases it is the females which secrete and exhale the alluring emanations which so powerfully attract the males, as is established by the well-known method of obtaining male specimens of the Emperor Moth, the Vapourers, etc., by exposing a virgin female in the known haunts of the particular species. The stimulating emanations are probably perceived by the males through the medium of their beautifully plumose antennæ, which are so characteristic a feature in the males of those forms in which the function of attraction is transferred to the female.

In addition to these pleasing perfumes, secreted and diffused for the purpose of attracting and stimulating the opposite sex to conjugal union, there are in many butterflies and moths, others of a repellant and defensive character, which emanate from certain minute glands upon the body, whose function is to secrete a somewhat oleaginous substance and shed, when necessary, its repulsive and nauseous effluvia, which recall various disagreeable substances, such as acetylene, stale tobacco smoke, decaying animal refuse and other distasteful and offensive substances, and therefore constituting a protective device against lizards, birds and other enemies.

These glands are in many cases practically restricted to the female sex, but where present in both sexes, the secretions are stated to be invariably much more pungent and penetrative in the females, and this is believed to be due to the greater importance of the female to the welfare and continuance of the race.—North Grange, Horsforth, Leeds, Sept. 9th, 1918.

[Apart from the scents alluded to by Mr. Taylor, it is probable that in most lepidoptera the scent is far too subtle to be appreciated by man at all, but is evident enough to the insects. Nor does it follow that because a scent is obnoxious to human beings it is so to moths; often, likely enough, quite the reverse is the case. As an instance, we know that the Purple Emperor Butterfly (*Apatura iris*) feeds with avidity on carrion and other putrid substances, and such substances are sometimes used as a lure to tempt the butterfly down from the high oaks, that it may be the more easy of capture.—G.T.P.].

NOTES ON THE SPIDERS OF NORTH YORKSHIRE.

J. W. HESLOP HARRISON, D.Sc.

THE following notes may be regarded as a continuation of those contained in my papers published in this Journal in August, 1914, and January, 1915, and probably represent the fruits of my last Arachnid hunts in the county, as I have now left the Middlesbrough district.

Dysdera crocata (C.L.K.). Sparingly, near Middlesbrough, and at Yarm. I have very great doubts as to whether this spider has any real claim to be considered a genuine native of the county.

Agroeca brunnea (Bl.). Thinly distributed over all the Cleveland Moors.

Oxyptila praticola (Koch.). Two or three females in scattered localities at the base of the Cleveland Hills, between Broughton and Stokesley.

Tarentula andrenivora (Walck.). A few on Easby Moor.

Lycosa agricola (Thor.). Common on the Yorkshire side of the Tees near Middleton-in-Teesdale (vice-county 65).

Lycosa nigriceps (Thor.). As previously, abundant everywhere in Cleveland; much scarcer on the heather not far from the locality recorded for the previous species.

Lycosa amentata (Clerck.), *L. pullata* (Clerck.), *L. lugubris* (Walck.). All very abundant on the Yorkshire side of the Tees, near Middleton-in-Teesdale.

Theridion denticulatum (Walck.). Singly, under bark, near Middlesbrough.

Ceratinella brevis (Wid.). Not uncommon near Middleton-in-Teesdale, but in vice-county 65.

Lophomma herbigradum (Bl). With the preceding.

Evansia merens (Cb.). Abundant everywhere in Cleveland; only noticed here because I have recently seen it with *Lasius umbratus* near Great Ayton. I have now taken it with four species of ant, viz., *Formica fusca, Lasius niger, L. umbratus* and *Myrmeca rubra.*

Notioscopus sarcinatus (Cb.). The *Sphagnum* having vanished in the original station owing to drainage, the spider no longer exists there; nevertheless, it is as common as ever elsewhere on Eston Moor. Its other habitats on the remoter moors are quite undisturbed.

Hypselistes jacksonii (Cb.). Still common at Eston in spite of the drastic drainage operations initiated there a year or two ago. It occurs everywhere in the *Juncus effusus* tufts which line the runner draining the main central *Eriophorum* bog. I have also captured it whilst examining *Comarum palustre* roots for Coccids. It is always to be found low down in the plants. For two or three years the drainage seemed to affect it considerably, but now that matters are stabilised, it has resumed and maintains its usual numbers. Its congener, *H. florens*, has occurred with it, but was originally found in boggy spots on the site of old jet workings on the northern slopes of the hill at a height of over 550 feet.

Maso sundevallii (Westr.). In a little wood near Middleton-in-Teesdale. (65),

Hilaira uncata (Cb.). Very rare opposite Middleton, thereby contrasting greatly with its abundance throughout the Cleveland area.

Leptyphantes terricola (Koch.). Not really rare in the various woods a few miles out from Middlesbrough, but far from being as plentiful as it would be in similar spots in North Durham.

Tetragnatha extensa (L.). In watery places, Yarm, Gunnergate, Broughton.

T. solandri (Scop.). Beaten from spruce in Marton Gill—is probably not rare.

Epeira triguttata (Fab.). Rare on various conifers in the Gunnergate Woods.

E. quadrata (Clerck.). Brought to me from Whitby.

E. cucurbitina (Clerck.). Inexplicably overlooked by me previously but now recorded as very common on various shrubs throughout the lowlying grounds at the northern base of the hills.

[In addition to the above I have taken a single male of a third species of *Philodromus* which was unfortunately mislaid before its specific identity had been determined].

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ORNITHOLOGICAL OBSERVATIONS AND REFLECTIONS IN SHETLAND.

EDMUND SELOUS.

(*Continued from page 296*).

October 20th.—When the Turnstone takes flight, all sorts of white and dark-hued markings become visible, bannering above it, as it lifts its wings, making it a very conspicuous pied bird, which was by no means the case before. The habits of these birds are those of their kind, set to the appropriate surroundings. They come down, usually, in a little flock on the wet rocks, and search about amongst the newly exposed seaweed, not staying very long in one place, and objecting to the play of the waves, if too rough—play should be play and not earnest. Whilst thus walking about, feeding, they keep constantly pecking at something, in a quite satisfied manner, but what it is I cannot say. No laboured action of picking, pulling, knocking off or otherwise dislodging shell-fish, is discernible. As said before, they fly up, all pied and conspicuous, but disappear as they settle, again, on the rocky platform, in a wonderful manner. The pursuing Hawk, baffled according to plan, desists instantly, and, turning short round, flies off, with murmurs unjustly directed against Darwin, whom he doubtless considers responsible for the whole affair—for a purely impersonal concept must be held to be beyond the limits of avine intelligence. The exodus is often in consequence of too boisterous a wave, inconsiderately dashing them with its spray. Still more often, however, this is not the case, nor is there any other apparent reason except that it seems to occur to all of them, and all in a flash, that they have been there long enough, and can do better elsewhere. In either case—always I believe—as they take wing, they utter their note, which is a little, hard querulous chirp, repeated several times, in a little burst. So at one do they seem, so all at once is the flash-out of their flight, that one might think they must always act together, that in leaving the rock, at any rate, it must always be one and all. But this is not the case. Any individual bird, in the little band, is quite capable of resisting

the example—the incentive—strong though it may be—of that sudden quick cry, and all-off, and of staying behind; and will do so, as I have just seen, if sufficiently interested in any research it may be making, or it may simply stand still—interested in nothing apparently—and e'en let them go.

I also thought, this morning, that I saw a Golden Plover feeding on the rocks in this way, but may have been mistaken.

Starlings and Rock Doves fly about and feed, together, here, over the cultivated parts of the land. When they all go up, at once, the large light blue flashes, with the smaller brown dots amongst them, look very pretty.

Starlings pay much attention to cow-dung, and are often very near to the cows. I have seen a bird close against the foot of one, and pecking, but whether at the foot I cannot say—I hardly think so.

I have now seen Eider Ducks of both sexes swimming together, like any other Ducks, at this time of the year. Each seemed equally indifferent to the other, but there may be no such indifference really. I counted twelve males on the water, and one feeding on the rocks (it was off some rocky islets, not too far out for the glasses) and the females may have been as many or more, but were not so easy to make out, and also seemed to dive oftener.

There is now, at 3 or 3-15 p.m. (as far as I can judge, through my watch going fast) a great congregation of Kittiwakes off the east coast. The birds all seem to be in a state of pleasurable excitement. Their harsh, but not unpleasing throats are in continual exercise, so that, softened by the numbers—each individual cry being merged in every other, and thus losing some of its acrimony—it becomes a sort of clangorous *susurrus*. The number of the birds, I should imagine, must be, at least, three hundred, but it may be many more. They are gathered closely together, the space covered by their bodies having, roughly, the form of a circle, and whilst the great mass of them, at any one time, are on the water, small parties keep rising and flitting, a little, over the assemblage, to come down within it, again; or, by ones, two and threes, birds will change their places, the effect being as of a constant clustering, so that the scene is full of animation as well as beauty, for the birds, as they float on the wave, are all grace and delicacy, whilst the light mauve of their backs and wings, and whiteness of their tails, as they rise, and float above it, add a charm more fay-like and unique. Then, all at once, single-thoughtedly, and for no other conceivable reason than the will to do so, the whole great concourse, rising in a thick cloud, and with a wonderful effect of pinions and tails, as aforesaid, sweep outwards to all sides, so that the cloud becomes thinner, and having wheeled, flitted and hovered, for a little,

sweep together, again, and go down where they were before. There is then the same scene of clamour and excitement, for some ten or fifteen more minutes, when about a third of all the birds flit up, and hover, for a little, over the main host on the water. Then again, in one instant, with the most absolute unanimity, as far as the eye can pronounce, these, too, rise, and mingle with their brethren—absorb them, rather—after which there is the same graceful flitting and circling, and again all go down, but not on quite the same spot of the sea.

And now, another strange thing happens, for, at once, as though some fear had oppressed them, the voices of the birds all sink, and, for clamour and jangle, which, till now, has been increasing, there is entire silence through the whole of them. Why some three hundred birds, or so, that have all, up till now, been excitedly vociferating, should all cease to do so, at just the same time, it is hard to imagine. There was certainly no cause for alarm, no bird of prey in the air, no seal or porpoise from beneath. The sea is open,* and, under such conditions of nearness and clearness, mistake or non-observance impossible. Nor had any sudden wind sprung up, to end the calm stillness of to-day and many days previously. Yet so it is—full conversazione up to a certain moment, and then as though a silence spoke. It lasts for many minutes, then gradually the clamour recommences, but does not, for some time, regain its full volume. Now, however, it is, again, normal, and has even been beyond it, having risen, at one time, to a very high pitch. Then, once more, there is that strangely sudden lull—a silence almost total, broken only by a suppressed individual sound, now and again. Some ten minutes have gone by, but the clamour has not been renewed. The birds are now riding, all clustered together, in an extended oval formation, quite close in shore. I try to count them and have got to nearly the first hundred, when, as though threaded on rows of strings which had all been suddenly jerked upwards, the whole of them, in one instant, rise as one, and speed swiftly away, southwards, down the coastline. No more than in the first instance, as narrated, or on the occasion of either of the strange, sudden silences, was there any perceivable cause for this instantaneous out-flight *en masse*.

There may be those to whom such facts as the above present no difficulty; nor do they, indeed, to me, insofar as their existence is concerned, for, after all, not much would

* I mean beyond the gathering; but supposing such an animal to have approached invisibly and passed beneath it, it is not easy to imagine such an effect as this resulting. Had it emerged, at one point, or broken the surface in a continuous line, localised confusion and flight up would have answered to this, and I must then have seen something of the cause. There is nothing relevant to it in the fact noted.

happen were it dependent on my understanding it, and I include others—in fact everybody—in this modest view. A point is soon reached, as we proceed backwards in the chain of cause and effect, where the human intellect is quite baffled, nor can we really be said to understand what is consequential, only, when what is causal to it cannot be grasped, or even dimly conceived of by us—we are acquainted with such things, and that is all. Essentially, therefore, the nature and origin of the sense-organs is not less obscure than that of any feeling or faculty—assuming such to exist—that does not manifest through these. Do such feelings and faculties exist ? It is a question of evidence. The only possible cause, that I can see, for such sudden unanimous movements, or cessations of movement, amongst numbers of birds, as I am here considering, is an inward impulse, collective or transfused—in the latter case with extreme rapidity—not originating in or dependent upon any extraneous influence cognisable by those senses which we share with birds and other animals. By cessations of movement, I mean the sudden silences—since sound here represents muscular action—and of this I have recorded an instance more surprising even than those here given, because extending over a wider area, whilst an independent observation, made by two witnesses, is still more remarkable, both in this respect and, also, perhaps, by reason of the combination of the two forms of simultaneous action.* I will quote both cases, for I confess I think the subject more important—at least more fascinating—than much in ornithology which is much more reported on, as, for instance, the period of gestation, in any species, and the size, colour and markings of (so far as procurable) all its eggs.

(*To be continued*).

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Large Wasp's Nest at Huddersfield.—Recently my friend Mr. Whiteley Tolson, of Oaklands, Dalton, sent me an enormous wasp's nest, which had been built on the floor of his disused pigeon loft. It is forty inches in circumference, fourteen inches in diameter, and seven inches in depth. In shape and appearance it is very much like one of the old-fashioned straw beehives, but is of a slaty earth colour. Mr. Tolson's gardener says it was built during the summer of 1916, so probably it has become somewhat sullied in appearance. Perhaps some hymenopterist will be able to tell me whether wasps' nests of this size are of frequent occurrence, and also what species of wasp is likely to have made it.—Geo. T. Porritt, Elm Lea, Dalton, Huddersfield, September 9th, 1918.

* See, however, *post*.

THE SPIDERS OF YORKSHIRE.

WM. FALCONER,
Slaithwaite, Huddersfield.

(*Continued from page 257*).

CLASS—ARACHNIDA. ORDER—ARANEIDEA.

Fam. DICTYNIDAE, 7-14.

Gen. *Dictyna* Sund., 3-7.

D. arundinacea Linn.

Very widely distributed in the British Isles and on the Continent, and usually common; mainly binds together heather shoots and grass spikelets; the ♂ is often found wandering. *Adult* May and June. First occurrence—the author, Slaithwaite, Sep., 1899.

V.C. 61.—Spurn, Houghton Woods (Market Weighton), T. S.; near Selby, Skipwith and Riccall Commons, W. P. W., W. F.; Rillington.

V.C. 62.—Eston and Ayton, 'very plentiful in the immature condition,' Cleveland, 'common,' J. W. H.; Langdale Moors, R. A. T.; Ringingkeld Bog; Levisham.

V.C. 63.—Wilsden, R. B.; Martin Beck Wood, C.; near Windsor Castle (Slaithwaite), Butternab Wood, Honley Wood (Huddersfield), scarce in these localities.

V.C. 64.—Burley-in-Wharfedale, Morton, Kildwick Moors, W. P. W.; Sawley district, many, S. M., W. F.; Adel Moor, Moor Allerton, Stubbing Moor and Dalton Lane in the Leeds district.

D. uncinata Westr.

British and Continental range wide; on bushes, especially furze, and occasionally on the ground. *Adult* May to July. First occurrence—the author, E. Keswick, June, 1903. Abundant in many parts of the county.

V.C. 61.—Noted for a score of widely separated localities, mostly in the southern half of the division.

V.C. 62.—Marton, Gunnergate and Nunthorpe, not uncommon, J. W. H.; Scarborough, R. A. T.; Upleatham; Lazenby.

V.C. 63.—Maltby, Y. N. U.; Askern; Coxley Valley.

V.C. 64.—Cocket Moss, Settle, W. P. W.; Wharfedale, from Burley to Collingham, especially plentiful on furze in lanes about East Keswick, Dalton Lane and Stubbing Moor; Adel Moor, Leeds; Grimbold's Crag (Knaresborough); Chandler's Whin (York).

D. laiens Fabr.

Common in the south of England, some of the northern counties, and in Ireland, but absent from Scotland; occurring also in several European countries as far east as Russia; often on furze. *Adult* May to July. First occurrence—the author, Linton Common, June, 1903.

V.C. 61.—Skipwith Common, adults of both sexes.

V.C. 62.—Staithes, 'common on sea banks,' and Runswick Bay, J. W. H.; Thornton Dale, R. A. T.; Levisham; Kilton Woods.

V.C. 64.—Linton Common, both sexes plentiful.

Gen. *Protadia* Sim., 1-2.

P. subnigra Camb.

A rare spider on record for 8 widely separated localities in the south of England, and for Wallasey (Cheshire).

V.C. 61.—Spurn, one ♀, June, 1908; Humber shore at Patrington, 1♂, June, 1910, T. S.

Gen. *Amaurobius* C. L. Koch., 3-3.

A. ferox Walck.

Common in the south of England and in parts of Ireland, becoming much rarer the farther north and in Scotland; abroad noted for Sweden, West, South-west and Central Europe, Italy and United States. *Adults* most months of the year. First record—R. H. Meade, Bradford, S. G. B. I.

V.C. 61.—Beverley, several examples, Miss W. A. Lockyear (*Trans. Hull Field Club*, 1908); Easington, W. C. England (H. M. P. No. 59).

V.C. 62.—Scarborough, 1 ♀, H. C. D.; Cayton Bay, 2 ♀'s, R. A. T.

V.C. 63.—Bradford, cellars and neglected buildings, R. H. M.; Shipley, W. P. W.; Askern, ♀, T. S.; Saltaire, ♀, P. K. Winter; Heeley (Sheffield), ♂, T. W. Wilshaw; Almondbury, ♀, in a cellar.

V.C. 64.—Kildwick, W. P. W.; Wetherby J. G.

A. similis Bl.

Very common and widely dispersed in the British Isles; abroad—France, Hamburg and North-west Spain; usually, though not always, an inhabitant of cellars and outhouses; often in old walls. *Adults* throughout the year. First occurrence—the author, Slaithwaite, October, 1898. Probably generally distributed throughout the county, having been noted for all the vice-counties, and in the first four extensively and commonly.

A. fenestralis Stroem.

One of the most abundant spiders in Ireland, Scotland and the north of England, but rare in the south of England; becoming common again on the Continent; in a great variety of situations, under stones, amongst fallen leaves, débris and grass roots, beneath the bark and in the cracks of trees, etc.; sometimes in cellars of houses and in outhouses. *Adults* throughout the year. First occurrence—the author, Slaithwaite, May, 1898. As in the last named, but recorded stations more numerous still.

Fam. Oonopidae, 1-1.

Gen. *Oonops* Templ., 1-1.

O. pulcher Templ.

Widespread and not uncommon in many parts of the British Isles and the Continent (except Central Europe) and extending to Madeira; beneath stones or amongst fallen leaves, débris and at grass roots. *Adult* in June and July mainly, but immature examples most months of the year. First occurrence—the author, Slaithwaite, May, 1897.

V.C. 61.—Burton Constable, Houghton Woods (Market Weighton), T. S.

V.C. 62.—Very widely distributed and recorded from many localities in the Cleveland district, and about Scarborough.

V.C. 63.—Bradford and Shipley districts, G. H. O., W. P. W.; Edlington Wood, H. V. C.; noted for a wide area around Huddersfield and in some of the localities fairly common; Thornhill Lees.

V.C. 64.—Giggleswick, Saltaire and Bingley, W. P. W.; Knaresborough and Malham, Y. N. U.; Sawley district, S. M., W. F.; several localities about Leeds and Wharfedale from Barden Tower to Collingham; Washburn Valley.

V.C. 65.—Tanfield.

Fam. Dysderidae, 3-6.

Gen. *Dysdera* Latr., 1-2.

D. crocota C. L. Koch.

Widely distributed abroad, extending to South Africa and North and South America, general and not uncommon in Ireland, but

rarer in Great Britain, especially in the north. *Adult* from May to August. First record—R. Gilchrist, Scarborough, *Naturalist*, June, 1906.

V.C. 61.—Hull, cupboard of a house, one ♂, fairly common amongst loose lumps of chalk on an embankment on the Humber shore between the New Joint Dock and Saltend Common, Thorngumbald, in an outhouse, Rye Hill, one ♀, T. S.; other houses in Hull, Messrs. Bartley and Sutcliffe; Southfield Pits, near Hessle, one ♀, and Spurn, two ♀'s, E. A. P.

V.C. 62.—Scarborough, 3 ♀'s from a garden, R. G.; Middlesbrough, one ♀, J. W. H.

V.C. 64.—Bolton Abbey, one ♀, Mr. Roose.

Gen. *Harpactes* Templ., 1-1.

H. hombergii Scop.

Widely distributed in the British Isles and on the Continent; beneath the loose bark of trees or amongst fallen leaves, grass and heather. *Adult* throughout the year. First record—S. G. B. I., 1861-64.

V.C. 61.—Y. N. U., Hornsea Mere, Selby, Houghton Woods, Holme-on-Spalding Moor, Meaux, T. S.; Hessle, E. A. P.

V.C. 62.—Scarborough and high moors near Whitby, R. A. T.; Cock Mill (Whitby); Boulby; Kilton Woods.

V.C. 63.—Collyer's Wood (Shipley), W. P. W.; Thornhill Lees; Grimescar Wood, Honley Old Wood, Woodsome, Almondbury (Huddersfield).

V.C. 64.—Howden Ghyll, W. P. W.; Bishop Wood, T. S.; Adel; East Keswick; Woodhall; Linton Common; Boston Spa; Birkham Wood (Knaresborough); Risplith House (Ripon); Hackfall; Giggleswick Scar; Malham Cove; Ingleton.

V.C. 65.—Tanfield.

Gen. *Segestria* Latr.. 1-3.

S. senoculata Linn.

Widely distributed in the British Isles and on the Continent, especially North and Central Europe; beneath stones, under loose bark of trees and fences or in wall crevices. *Adults* most months of the year. First occurrence—the author, Slaithwaite, June, 1897.

V.C. 61.—Found in most parts of the division and in many places very common beneath the bark of trees and fences, T. S., E. A. P., W. F.

V.C. 62.—Middlesbrough district, 'common everwhere,' J. W. H., G. B. W.; Beast Undercliff, Staintondale, T. S.; Hackness, R. A. T.

V.C. 63.—Bradford district, G. H. O., W. P. W., J. A. B.; Earby, F. R., Y N.U., Cusworth (T. S.), and Cawthorn. Wilberlee, Tiding Field, Lane and Tanners' (Slaithwaite); Cop Hill (Meltham); Wilshaw; Lepton Great Wood; Almondbury; Woodsome; Armitage Bridge; Marton Wood (Holmfirth); Denby Dale.

V.C. 64.—Arncliffe, T. St.; Grassington and Austwick, W. P. W.; Ingleton and Gargrave, F. R.; Bingley and Winterburn, R. B.; Bishop Wood, T. S.; Menston; Harewood; Woodhall; Compton Bank Top.

V.C. 65.—Coverham, W. E. L. W.

Fam. Drassidae, 7-22.

Gen. *Prosthesima* L. Koch., 3-9.

P. apricorum L. Koch. (*petiverii* Scop.).

Not a common spider in Great Britain, where it has been observed in various places as far north as Edinburgh and in St. Kilda; rare in Ireland, but commoner and with a wide range on the Continent,

extending to Siberia and North America. *Adult* June and July. First occurrence—T. Stainforth, Staintondale, July, 1910.

V.C. 61.—Skipwith Common, ♀.

V.C. 62.—Beast Undercliffe, Staintondale, two adult and two immature ♀'s, one immature ♂, T. S.

V.C. 64.—Malham, ♀, F. B.

P. latreillei C. L. Koch.

Rare in Great Britain, it has been met with in several English counties from Dorset to Northumberland and the Isle of Man; widespread and not uncommon in Ireland; on the Continent in France (north and east), Germany, Austria-Hungary. *Adult* June and July. First occurrence—T. Stainforth, Spurn, June, 1909.

V.C. 61.—Spurn, one adult ♀, four immature ♀'s, one immature ♂, T. S.; later E. A. P.; Humber shore at Welwick, adult ♀, T. S. Probably also at Kelsey Hill, as both Mr. Stainforth and Mr. Parsons have sent me immature examples from that place.

V.C. 64.—Grassington, scrub adjoining Grass Woods, one ♂, several ♀'s, W. P. W.

P. electa C. L. Koch.

A very rare British spider, only to be met with on sandhills on the coast; sparingly on Largo Links and near Edinburgh, Scotland; Kent, Sussex, Suffolk, Glamorgan and Cumberland; at Southport and Deal. *Adult*, May and June. First occurrence—T. Stainforth as below.

V.C. 61.—Spurn, one ♀, May, 1908; one ♂, 1909, T. S.

Gen. *Drassus* Walck., 3-7.

D. lapidosus Walck. (includes *D. cupreus* Bl.).

Common and widely distributed at home and abroad (Holarctic Regions). *Adult*, ♂ May and June, ♀ April to November. First occurrence—the author, Slaithwaite, July, 1897. Very widely distributed in the county, but most plentiful in localities towards or on the coast, *e.g.*, Cleveland, 'in all the localities visited,' J. W. H., and 'very common in East Riding under stones, logs, etc.,' T. S.; becoming scarcer proceeding inland to the western hills. *Lapidosus* is the commoner form near the coast, and *cupreus* inland.

V.C. 65.—Cautley, W. P. W.

D. troglodytes C. L. Koch.

Widely distributed in the British Isles and the whole Palæarctic Region; under stones and low plants, vegetable débris, etc. *Adult*, June and July. First occurrence—the author, Slaithwaite, June, 1897.

V.C. 61.—Spurn, Sandholme, Snake Hall Moor (North Cave), Houghton Woods (Market Weighton), T. S.

V.C 62.—Eston Nab, G. B. W.; Middlesbrough district, 'common on all the moors,' Cleveland, 'every locality visited,' J. W. H. Ringingkeld bog, R. A. T.

V.C. 63.—Cupwith Reservoir, Bottoms Wood, and Windsor Castle near Slaithwaite; below Dean Head Church, Scammonden; Crosland Moor; Upper Harden Clough, Meltham.

V.C. 64.—Alwoodley, near Leeds.

D. sylvestris Bl.

Only a few examples of the immature form '*criminalis* Camb.', which were named by the Rev. O. P. Cambridge, have been taken; an adult, therefore, of this southern spider is needed to establish it as a Yorkshire species. It has been, however, taken in Lincs., Staffs. and Berwickshire, in similar situations to the other species.

V.C. 63.—Pole Moor, Lane, and near Jerusalem farm, Slaithwaite; Wessenden Valley; Crosland Moor.

(*To be continued*).

COMMON WILD BIRDS OF THE SCARBOROUGH DISTRICT.

W. GYNGELL.

(Continued from page 261),

*The Robin Redbreast (*Erithacus rubecula* L.). Although I have given the bird's second name I can scarcely ever remember here or elsewhere having heard the word 'redbreast' used. As common here as anywhere else in Britain year in and year out, its cheering and encouraging song I have heard on every day of the year; once on Christmas eve *in* the Market Hall, Scarborough. Once on the building of a dirty back street in Bolton, Lancashire, at 8 a.m. on January 16th. At Midsummer, I have heard it from 2-7 a.m. till 8-40 p.m. A roadside bank is the favourite nesting site, but, like the Redstart, it often occupies a hole in tree or wall or discarded pot or kettle. Sometimes right on the ground; never more than six feet above it. Moss, grass, hair, dead leaves, wool and herbage stems comprise the materials that I have seen used. Eggs may be found in the nest from April 16th till June 29th. Five is the usual set, though not unfrequently six are laid, average weight ·09 to one-tenth of an ounce. The usual colour and markings are well enough known, often there is one egg in the set much lighter in colour than the others. I have found them pure white. The Robin seems loth to retire at night and when it is so dark that one can scarcely identify the bird it will flit out before one's feet whilst one is homeward bound through a country lane and snatch some insect for supper, repeating the performance several times at great risk of being trodden upon. Generally distributed throughout the district in anything like congenial haunts, I have seen it occasionally on the rocks of the sea shore. Once a Robin visited and pecked at some hawthorn berries that had been placed in a vase of water on my outside window sill.

*The Common Whitethroat (*Sylvia cinerea* Bechstein). A common summer visitor here from April 24th to September 15th and locally called 'Peggy.' Usually haunting hedge-rows and woods, but on more than one occasion I have come across it in small isolated bushes on the wildest parts of the moors. Not a very free singer it may be heard in full song until July 26th and I have heard it utter a few feeble farewell notes as late as September 3rd. At midsummer it may be heard from 2-58 a.m. till 8-50 p.m.

It usually sings in hedges or low bushes or during one of its characteristic short jerky flights up into the air, but I have heard it in a tree 25 feet up and sometimes whilst it was perching on a telegraph wire. I have found its nest in brambles, furze and other bushes, hedges, honeysuckle and nettles as low as 6 ins. and as high as 4 feet above the ground. The nest composed of dry grass, fine rushes, roots and hair is *always* in my experience of nests examined, finished off with a decoration of spiders' nests and is in this respect unlike any other bird's nest that I know. The five eggs—once only have I found six in a nest—vary most remarkably in ground colour and marking, more so, I think, than any other small bird's eggs in Britain, not excepting the very variable eggs of the Tree Pipit; a rare variety somewhat resembles the well-known pink variety of the eggs of the Blackcap. I have a clutch of these and have heard of another Yorkshire set, but have seen no note of this variety in any work on British birds. The egg weighs ·07 oz.

*The Lesser Whitethroat (*Sylvia curruca* L.). Since I became familiar with the somewhat feeble but very distinct song of this little bird I have been surprised to find how much more common it is than is generally supposed. One week in summer, having business in Bridlington, Driffield, Beverley and Hull, I heard its voice in each of these towns. It nests within

the borough and is fairly common about the Scarborough district. From April 26th until July 8th it sings continuously in hedges, bushes and trees, rising higher amongst the foliage than the last-named species and in this habit seeming to belong more to the Willow Wren tribe. Its nest, usually built from 3 feet to 7 feet above the ground in hedges, bushes or low herbage—one that I found was in a thin, young larch—is I think, the smallest and lightest nest, properly so called, made by any British bird. I have weighed one and found that it did not exceed the eighth of an ounce. Made of the finest dead grasses and herbage stems, roots, hair, wool and spiders' web it is the merest ghost of a nest. Five eggs are laid each weighing but ·05 oz. I copy the following from my bird note book, written at the time of occurrence: 'when I found one nest in a hedge and containing only three fresh eggs, the female left the nest and with a shivering motion of the wings fluttered along the ground for thirty to forty yards, the action which is supposed to be one of a bird's devices for enticing an intruder away from the nest. I have never before or since seen any bird continue this action for so long. These eggs were hatched thirteen days after laying.

The Blackcap (*Sylvia atricapilla* L.). A fairly common bird in our most sheltered woods from April 24th, singing freely until June 21st and on that day from 2-26 a.m. till 8-48 p.m. Amongst its full rich notes it sometimes introduces some rather harsh and squeeky sounds. Then and at other times I find it most difficult to tell whether I am listening to a blackcap or a garden warbler, a scarcely inferior songster. Its thin nest is made of roots, grasses, vegetable down, wool, horse-hair and rarely a little moss. It is placed in brambles and herbage, low bushes or honeysuckle from 18 ins. to 5 feet above ground. Usually five eggs, I have found six in a nest all more or less of the typical colouring; once only a nest containing five of the distinctly rare and beautiful pink variety. Weight of an egg ·06 oz. Twice I have seen the cock bird sitting.

*The Garden Warbler (*Sylvia hortensis* Bechstein). I think I am justified in saying that twice as many Garden Warblers as Blackcaps come to this district every summer. In most other parts of England their comparative numbers are, I should say, reversed. I have heard it singing from May 11th to July 12th and from 2-20 a.m. till 8-25 p.m. In nesting habits it much resembles the last-named species though often choosing more open situations, and from 1 foot up to 7 feet above ground—higher than the Blackcap builds—in brambles, herbage, bushes and honeysuckle. The nest is usually of lighter construction than that of the Blackcap, dead grasses, fine roots and hair being the only materials used in the nests that I have examined. Usually five eggs, I have found seven in a nest. Weight, ·07 oz. He is a very cocksure ornithologist who says that he can always distinguish these from the Blackcap's eggs. The usual alarm note is a harsh 'Chur, chur, chur, chur,' rapidly uttered, but one I heard uttered a shrill loud cry like the call of a young thrush when caught, whilst its mate uttered a faint pee-*eep* like the alarm note of the Willow Wren. The former of the two birds came within a yard of me and displayed intense agitation, although its nest contained only two eggs.

Respect for the editor's difficulty in finding space forbids me here to dwell on the subject of individual character in wild animals, but long experience has led me to the conclusion that one individual of a wild species may differ as much in character from other members of its own species as one domestic cat or goose may do from other members of its fraternity.

The Golden-Crested Wren (*Regulus cristatus* Koch). A resident bird, not uncommon in most sheltered woods, especially where spruce and silver firs occur, though in hunting for food they do not confine their attention to these trees. In autumn large numbers are added to the residential population. I have heard its faint and very rapid song as early as February 14th and as late as August 19th. The host of autumn

migrants soon break up into little parties and joining Cole, Marsh and Blue Titmice haunt the woods for insect food, constantly calling to each other as they flit about. At this time they may sometimes be seen to leave the upper branches of trees and flutter butterfly-like down to the ground, apparently chasing small insects or to retrieve a fallen morsel of food. Tame as these *real* woodland *fairies* become sometimes, one can rarely get near enough or in the right position to see during their incessant restlessness the very beautiful golden crest. The nest, composed mainly of moss is lined with abundant feathers and some hair, decorated with lichens and spiders' webs, *always*, in my experience, woven into and suspended from a lateral branch of a spruce or silver fir, spiders' webs being the sole support. It is placed from 5 to 16 feet above ground and often contains as many as ten eggs. It would take about thirty-three of these to weigh one ounce.

*The Chiff Chaff (*Phylloscopus rufus* Bechstein). This is the first of our Summer visitors, sometimes arriving as early as March 24th. Consequently all bird lovers who *know* birds and do not merely read about them in more or less inaccurate 'popular' books look and listen for it as Lady Day approaches and accord it as hearty a welcome as they do the Cuckoo or Swallow. Fairly common in woods of fair size it remains with us sometimes as late as September 20th, whilst there is positive evidence that this or the next species—which very closely resembles it—sometimes remains here through the winter.

Its bright little song, which on June 21st, one may hear from 3 a.m. till 8 p.m., becomes very faint and sad-sounding in September. Though arriving so early I have not found eggs in the nest before May 19th.

With one exception only all nests that I have found have been built from 1 to 2½ feet above ground, in herbage, furze or other bushes, the exceptional case was a nest in a hawthorn 9 feet up. Dead grasses, dead leaves and fern and sometimes strips of bark are used as building materials. Usually five, sometimes as many as seven eggs are laid, their weight being ·04 oz. The alarm note is somewhat like the 'weet' of the Chaffinch and much louder than the Willow-Wrens call.

*The Willow-Wren (*Phylloscopus trochilus* L.). This species, as well as the last-named, are locally known as feather-pokes, from the nest that both species make and which is really a sort of pocket full of feathers. It has not been known to arrive here before April 8th, nor have we any positive evidence of its remaining after September 26th. Its delightfully sweet little song may usually be heard all the time that it remains with us, though its notes become feeble towards the end of its visit. From 2-25 a.m. till 8-45 p.m. at midsummer it may be heard in every wood, plantation or grove in the district. The nest, composed of dead grasses and herbage, moss, leaves, bark, feathers, is usually built close down in the ground in a wood or on a road-side bank, but sometimes it is raised 18 inches above ground. Six is usually the number of eggs laid, not uncommonly seven, and I have found as many as eight young birds in the nest. The eggs vary in weight from ·03 to ·05 oz. I once saw in autumn a variety of this species (or possibly, but less likely of the last named) with cream-coloured plumage.

The Wood-Wren (*Phylloscopus sibilatrix* Bechstein). Much less generally distributed than the two last-named species, this bird is quite as common in its own particular haunts, *i.e.* the fine old woods of deciduous trees such as those of Raincliff and Forge Valley. Arriving sometimes as early as April 23rd, I have not heard it sing after July 10th. The nest, strangely difficult to find, is, however, not always well concealed and sometimes, as when raised only a few inches above the bare ground in a beech wood, may be seen fifty yards away. Dead grasses, straw, dead leaves, but *never any feathers* enter into its composition. Six eggs usually, but I have found seven.

*The Sedge Warbler (*Acrocephalus phragmitis* Bechstein). Less

common than most of the other small warblers this noisy and aggressive little songster *makes himself heard* in the district from April 17th until August 7th, singing at all hours of the day and occasionally at any hour of the night. Here as elsewhere imaginative listeners have been known to mistake it for the Nightingale, which has only visited us once in the last thirty years. Its nesting haunts, though not confined to, are most frequently amongst low bushes and herbage by river side or swampy mere, but its nest may also be found in a furze bush or pollard willow stump, and sometimes in rushes actually growing in the water. From 1 to 7 feet is the range of height above ground. The nest, measuring 5 ins. in height and 2 ins. in depth inside is made of grass, moss, vegetable-down, feathers, hair, seeds of rushes, roots and herbage stems. Usually five; sometimes six eggs are laid. Weight, ·06 oz. Occasionally a nest is made that somewhat resembles that of the Reed Warbler, having single reeds passing up close to the nest sides though not actually through the nest walls, and I once found a nest with two nettle stems actually passing up through it.

The Grasshopper Warbler (*Locustella nævia* Boddaert). Heard as early in the year as April 16th, it has not been known to sing later than June 29th. I have no *early* morning record of its curious note which, however, I have often heard near midnight. The following notes are copied direct from my bird memo' book just as written: 'the *song* of this bird closely resembles the call of a large grasshopper, but is much more continuous; it also somewhat resembles a faint pea whistle or the wind blowing through a telegraph wire. The note *certainly does* rise and fall.' Although often described as being very shy and difficult of approach, that is not my experience. Once, near Scarborough, having heard and seen the bird from a distance of thirty yards, I very cautiously and slowly crept up to within *two paces* of it whilst it still continued singing or alternately preening its feathers and now and again creeping about the low briar bush in which it sat. On a previous occasion in Somerset, under similar circumstances, I crept up quite close to one. Although nesting more or less frequently within the borough boundaries, I have not had the good fortune to find a nest myself.

*The Hedge-Sparrow (*Accentor modularis* L.). Local name 'Cuddy.' Resident, very common, and an almost daily songster, singing more or less freely in every month of the year. Though its favoured haunts are gardens, shrubberies, hedge-rows and woodland, here it may frequently be seen and heard on the house-tops. I have found its nest containing eggs as early as April 11th and young in the nest as late as September 5th, but whether these were a first, second or third brood I could not say. Sometimes quite on the ground the nest, more frequently found in a hedge than elsewhere may be placed in furze or other low bushes, brambles or herbage, one was noticed amongst fine moor rushes, another seven feet above ground in a spruce fir. The variety of materials used embraces moss, twigs, wool, dead grass and herbage stems, dead leaves, roots, bark, straw, feathers, fur and hair. Never more than 6 eggs in a nest, usual weight ·07 oz., I have found one weighing as much as one tenth of an ounce and big enough though not heavy enough to pass for a Cuckoo's. I don't know when the Hedge Sparrow rises, but I have heard his song as late as 8-40 p.m.

(*To be continued*).

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We have only just heard that John Waddington, the well-known printer, of Leeds, died some little time ago. At one time he was keenly interested in the work of the Yorkshire Naturalists' Union, acted as its librarian, and had a seat on the Executive and other Committees. He was especially interested in the lepidoptera.

YORKSHIRE NATURALISTS AT SETTLE.

The 274th Meeting of the Yorkshire Naturalists' Union was held at Settle on Bank Holiday, August 5th. The Union was joined by members of the British Ecological Society, among whom were the President (Dr. Wm. G. Smith), Mr. A. G. Tansley, F.R.S., the Secretary (Dr. E. J. Salisbury), and a more ambitious programme than usual (under existing conditions) was arranged. The members assembled in goodly numbers at Huddersfield on Thursday, August 1st, when a meeting was held in the evening in the Biological Department of the Technical College, to consider some of the chief geological and vegetation features of the districts to be visited. The following four papers were given, illustrated by maps and lantern slides :—Dr. Wm. G. Smith, ' Plant Communities of Hills and Valleys ' ; Dr. T. W. Woodhead, ' Vegetation of the Pennine Moors ' ; Dr. A. Gilligan, ' Geology and Topography of Ingleborough ' ; and Mr. C. A. Cheetham, ' Vegetation of the Settle and Ingleborough District.' The members found good accommodation at the George Hotel, and early the following morning made an excursion from Marsden to Saddleworth *via* Wessenden and Bills o' Jacks, where typical plant associations of the Southern Pennines were seen. The journey was then continued to Settle, which was to be the headquarters for the four following days. Good and reasonable accommodation was provided at the Golden Lion Hotel, and the weather on the whole being very favourable, an interesting and profitable time was spent. Details of the excursions are given in the following reports. At a meeting held on Monday evening, August 5th, over which Dr. Wm. G. Smith presided, votes of thanks were accorded to Messrs. J. A. Farrah and Alric Watkins for permission to visit Keasden Beck and the moors at Dovenanter ; also to Mr. C. A .Cheetham and the officers responsible for arranging the details of the excursion. Mr. A. A. Pearson F.L.S., London, was elected a member of the Union.—T.W.W.

Geology.—Albert Gilligan, D.Sc., F.G.S., reports :—At the preliminary meeting held at Huddersfield, the writer gave a short sketch of the geological history and structure of the Pennine Chain, noting especially those features which would be encountered in the field and had a special significance for the ecologists. On the Friday, starting from Huddersfield, which is situated in the Lower Coal Measures, the route up the Wessenden Valley and across the moors to Saddleworth carried us through the whole succession of the Millstone Grit Series to the Yoredales of the Saddleworth Anticline. Fine sections of the Middle Grits were seen in stream sections and road cuttings, and splendid scars and bluffs of the Kinderscout Grit were well exposed above Bills o' Jacks and on the way to Pots and Pans. Attention was paid to the large hog-backed mounds in the Wessenden valley which had been conjectured to be due either to landslips or glacial action, but the better explanation suggested by observing the courses of the present lateral streams was that they were due to these streams changing their courses from time to time, first joining the main stream almost at right angles, and later damming their outlet and flowing parallel to the main stream for some distance before joining it, forming a shallow valley and leaving the mound between the main stream and the lateral. Later the lateral streams may resume their old courses, one such case being very evident. ' Pots and Pans ' is the local name for the curious pot holes in the Kinderscout Grit above Greenfield. These circular depressions are similar to those found in the Millstone Grit in many other districts where the resistant beds occur in exposed positions, and have been popularly ascribed to human agency or to the combined action of wind and rain. The large pothole around which the party gathered on an isolated block of grit had all the attributes of those which occur along river courses and formed by running water. Very noticeable was the bilateral symmetry due to the inclination of the axis as in the case of river potholes, and running water seemed the most likely agent to account

for them. Descending to Saddleworth Station, exposures of the thinly bedded Yoredales were noted, but no time was available for a close examination of the beds. The journey to Manchester was over the western limb of the anticline whose eastern limb the party had traversed in the morning, and the same rock sequence (but in the reverse order) was noted, and we were soon over the Permians, on to the boulder-clay which covers the Triassic plain. Leaving Manchester for Settle, our journey lay across the Burnley Coalfield, which is crossed by the line of the Caledonian folding in the Rossendale Anticline which brings up the Millstone Grit, evidence of which could be seen. Approaching Blackburn, the well-known form of Pendle Hill was seen on our right and formed a landmark for many miles. About Clitheroe the folding of the limestones and shales along the north-east—south-west axis (Caledonian) was splendidly displayed, while the limestone knolls, of which Pimlico Quarry (the name sounded familiar to the southerners in the party) shows a good example, made some of us wish for a halt. The flat top of Ingleborough seen on our left excited some interest, as the scene of our labours for the next few days lay in its vicinity.

Arriving at Giggleswick, the line of the South Craven Fault was traceable by Giggleswick Scar and turning eastward at Settle. The journey here, very briefly sketched, may indeed be described as one long feast of ' tectonics ' and difficult to surpass in this respect by any route of similar length in the country.

Ingleborough was our objective on the following day, and travelling *via* Horton-in-Ribblesdale to Ribblehead Station, which was the commencement of our walk, both the South and North Craven Faults, with the intervening three miles of Carboniferous Limestone were passed. The quarry in the Horton Flags and the unconformity of the Carboniferous and Silurian beds at Arco Wood, under Moughton Fell, were well seen from the train, as were also Fountains Fell, Penyghent and Ingleborough. The ascent of Ingleborough was made across the Great Scar Limestone of Gauber Hill Pasture, Colt Park and Park Hill, the overgrown limestone pavements of Colt Park being of extreme interest to the ecologists, but somewhat impeded the progress of the party. Of the oft described geological features of Ingleborough, Chapel-le-dale, etc., it is unnecessary to say much here except that the geologists found the time all too short and the workers too few to attempt making any real contribution to our knowledge of this area. Descending Ingleborough on the south-east, some of the party visited Hellan Pot, others crossed to Crummack Dale to examine the double unconformity at Crummack Beck Head, where the Carboniferous Limestone rests on a denuded anticline in the Silurians, and these are again separated from the Ordovicians by a bed of conglomerate marking an unconformity, as long ago pointed out by the late Professor McKenny Hughes in his work in this district. Sulber Nick proved an attraction to one of the party, who walked its length in solitude and traced it to its termination in the Scars above Horton-in-Ribblesdale Station. This depression is certainly the line of a fault or disturbance and is in the same straight line with the fault which had been seen on the north-west side of Ingleborough. Throughout its length the Nick is marked by large swallow holes, and though at a distance it appears like the fallen-in roof of a shallow mine, there is no evidence that minerals have ever been sought here.

The official programme for Monday gave rather a late start for Keasden Beck, so a few of the more energetic members anticipated this by about two and a half hours, and arrived on the ground in good time. Striking the beck not far above its junction with the River Wenning, hammers were soon at work upon the fossiliferous shales which succeed the Kinderscout Grit and are therefore on the same horizon as the Sabden Shales of the Pendle area. Several splendid exposures were encountered and large numbers of Goniatites, Posidoniellæ and Orthoceratites soon obtained.

The fault which crosses the beck was traceable, though not actually

seen, by change of dip of the beds. An interesting find near Turnerford was a boulder of ' Brockram ' forming one of the stepping stones across the stream. It had all the characteristic features of the Lower Brockram of the Vale of Eden as exposed at Stenkrith, near Kirkby Stephen, about thirty miles to the north, and different from the Brockram of Mason Gill, near Ingleton, about ten miles to the north-west. This is the first time Brockram has been recorded here as far as the writer is aware, and no other trace of such a rock was seen in the three and a half miles of stream explored. Higher up stream, the shales were replaced by strong grit which, while giving interesting scenic effects in the way of cascades, was relatively uninteresting.

The writer did not accompany the party on their visit to Moughton Fell to examine the peat which is here found growing in a depression in the limestone, but he had made an examination of it a month previously and is of the opinion that this seeming anomaly of a siliceous vegetation on a limestone area may be explained in the following way. As shown on another page the material upon which the peat is growing is non-calcareous and consists of sandy material which is highly ferruginous, and of such a nature that it could not have resulted from the solution of the pure Great Scar Limestone. Some of it may have been formed by the breaking up of the impure limestones and sandstones of the Yoredales, but the bulk of it must have certainly been derived from grit and sandstone. Patches of gravelly ice-borne drift occur plentifully in the neighbourhood and offer the solution to the problem. The depression or swallow hole was in existence in pre-glacial times and the melt-water from the ice carried into it detrital material, and this was subjected to a settling process, with many disturbances no doubt. The joints of the limestone acted like a sieve and allowed the finest material (which only differs from the larger in grade, being true rock flour) to pass into them and finally seal them up. This fine material, now hardened, is to be found in the cervices of the limestone round the steep scars of Moughton Fell in proximity to the peat. This sealing up would finally give rise to a pool in the depression, and this received further additions until the supply ceased. If any calcareous material was originally present, as doubtless it was, it has since been leached out. It seems that the analogy between the pool here postulated and the pools at the gravel pits into which the washings are conducted is complete. Three was no trace of lamination as is the case with the clay derived from ice-melt water seen so beautifully in Victoria Cave, but the penetrating rootlets of the vegetation would have destroyed this if it was ever present.

Victoria Cave was visited during the excursion and the party thus had an opportunity of examining the thick deposit of laminated clay preserved there, which the writer has described elsewhere, and of which a short account was there given. Mr. Wroot added much to the pleasure of the visit to the cave by his interesting lecturette upon its history and the results of the exploration carried on during the years 1867-1870, under the auspices of the British Association for the Advancement of Science.

Botany.—Dr. W. G. Smith writes :—Plant ecology was a prominent feature in the series of excursions arranged by the Yorkshire Naturalists' Union, but other aspects of botany were not neglected. No better programme could have been devised to show some of the many features of Yorkshire vegetation, because each district visited was familiar ground to the respective leaders, botanical and geological. The first day (Aug. 2nd) from Huddersfield to Saddleworth by Wessenden was an excellent epitome of the vegetation of the Grits and Shales of the Pennine watershed. Dr. Woodhead, on this area, which he has worked so thoroughly from every aspect bearing on plant life, demonstrated the succession from valley woods of Oak and Birch upwards to the Bracken and heathy slopes, and on to the Cotton Sedge moors so typical of the Pennines. The general impression left is a series of sombre types of vegetation, somewhat lacking

in brightness, a defect natural to these valleys, and no doubt due in some degree to the proximity of so many busy towns. The excursions of the next four days (Aug. 3rd—6th) from Settle centred round Ingleborough. The main object was to examine the contrast between the limestone vegetation and the adjoining types on non-limestone soils and rocks. Ingleborough, as a botanical centre, never fails to reveal something new. Its plant life depends so much on the geology that the itinerant demonstrations of Dr. Gilligan added much to the interest and enabled the party to appreciate the geological information amassed by a long race of Yorkshire geologists. Ingleborough has long been a shrine for the geologist, and these excursions will hasten the time when it will become a Mecca for the British ecologist. Under the guidance of Mr. Cheetham the party explored a wealth of vegetation rarely met with in such a small area. The limestone pavements were examined with keen interest, and from the bare pavement it was possible to trace the stages of filling up with denser plant growth, in one direction towards the scar woods, in another towards the grassy pastures. Colt Park and Oxenber Woods were past their best season, but the fruiting stages of most of the characteristic plants were seen. On the steeper limestone and grit crags, there are interesting arctic-alpine species, most of which were found. The vegetation with Ling, etc., on Moughton limestone was examined with interest, and Mr. Cheetham demonstrated its relation to the distribution of glacial deposits. Another feature was Thieves' Moss, with marl deposits and the occurrence of *Schœnus nigricans*, with an extensive area of Juniper not far off. The excursion of August 5th was to the south of Clapham, for the examination of Keasden Beck, which, with its sandstones and shales, presented the contrast necessary to bring out the features of the limestone. The following day was booked for Barbon Dale, but the weather, hitherto perfect, was unpromising, and a shorter route from Clapham by Norber and Crummack Dale was substituted; those who risked the weather were rewarded because it cleared, and an excellent excursion was provided. Space does not permit of lists of plants being included, but most of the species recorded in the various publications were seen. Much care had been expended in preparing the programme, and it must be gratifying to those concerned, that in every way the excursions were highly appreciated, especially in these days of stress, when field naturalists have so few opportunities for meeting.

Fungi.—Mr. A. A. Pearson, F.L.S., writes:—A short note for those interested in the mycological aspect of the ground covered may be included in the report. It was too early in the year for anything approaching a luxuriant growth of fungi, and a serious search was not made for them.

On the moors and elsewhere one could not help noticing the fine upstanding groups of *Anellaria separata*, a coprophilous black-spored species with a ring on the long stem. An occasional puffball was kicked over, and small specimens of *Psilocybe sub-ericæa* and *Galera hypnorum* almost exhausted the list.

On Monday's excursion fungi were more in evidence. A juicy wood near Keasden Beck yielded a fair number of species, but the delights of te brook itself enticed the mycologists away and only a very incomplete list was compiled. *Russula cyanoxantha* was common in the grass near the brook, where *Hygrophorus conicus* and *Nolanea proletaria* were also met with. Here, also, was a large white Clavaria nestling in the long grass, but specimens were not boxed for more careful examination.

Mycena galericulata and *M. vitilis* were gathered in the wood, and a good growth of *Peniophora hydnoides* was observed on rotten wood under oaks.

Mycologists would be amply repaid by a visit to Keasden Beck later in the year.

Mosses.—On the Ingleborough excursion most of the interesting mosses occurring there were seen; in Colt Park Wood we had *Thuidium Philiberti* Limp., and on the main limestone, at 2,000 ft., *Pseudoleskea*

catenulata B.S. (*Leskea catenulata* Mitt.), *Myurella julacea* B.S. ; just below these, on Yorkshire sandstones, *Andræa petrophila* Ehrh. and *A. Rothii* W.M.

This *Pseudoleskea* was the feature of the Stockdale excursion, being the most frequent moss on the walls and limestones at the top of the pass. In Keasden Beck the grit types were well displayed. *Catharinea crispa* James and *C. undulata* W.M., with shorter and wider leaves than usual, grew through sand accumulations, as did *Polytrichum commune* L. On rocks in the stream *Fontinalis squamosa* L., *Hypnum ochraceum* Turn. and its var. *flaccidum*, and *Hyocomium flagellare* Schp.

On Tuesday some limestone screes were examined, and the typical mosses *Hylocomium rugosum* D.N. and *Cylindrothecium concinnum* B.S. (*Entodon orthocarpus* Lindb.) seen. Crossing Crummack Dale on the Austwick grits, two Andreæas, *A. petrophila* Ehrh. and *A. crassinervia* Bruch., were gathered at the low elevation of 800 ft.

Birds.—Strangers to the district were struck with the number of Wheatears and Ring Ousels on the hills, and the Snipe in the wetter places, whilst the Curlew and the Redshanks on the moors, with Sandpipers and Dippers on the streams, lent a further interest with their calls.

Insects.—Few butterflies were seen, but the days were not very sunny ; the Whites, the Small Heath, Small Tortoiseshell, Common Blue and Meadow Brown were the only ones noted. The most interesting moth was the Antler, being *very* abundant and widely distributed.

Æschna juncea Linn. was the only dragon-fly taken on the excursion, but later in the week on Austwick and Lawkland Mosses this was again seen, and *Sympetrum scoticum* Don. was just emerging for the first time this year, whilst a solitary *Pyrrhosoma nymphula* Sulz. alone remained of the numbers seen in June and July.

Among Diptera the clouds of daddy-long-legs in the pastures called for most attention, the common one on the Mosses being *Tipula paludosa* Mg. ; another was the hover-fly *Sericomyia borealis* Fln., both ♂ and ♀ being taken. Other interesting flies were *Heliophilus pendulus* Linn. and *Bibio pomonæ* F., this being the first appearance of the latter this year in this locality ; *Culex pipiens* L. was also in evidence.

——: o :——

We should like to congratulate the Curator of the Colchester Museum on the valuable list of additions in its report for 1917-1918 just to hand, and on the concise but useful definitions. We miss the illustrations, which have been a useful feature of these reports.

Dr. J. W. H. Harrison gives details of several northern species in ' Gleanings from my Notebooks ' in *The Entomologist* for September. In the same magazine *Eucosmia undulata* is recorded for Cumberland, and a ' very beautiful observation ' of *Hyppa rectilinea*, presumably from the same area, though the locality is not given.

We have received the following extract from a Huddersfield paper :— ' The editor of *The Naturalist* severely rates the editor of the " Bible Students' Monthly " for a very unwise tirade against evolution. It might do the latter some good if he would borrow a book at some good library called " The Origin of Species," by one Charles Darwin, and read it carefully. And it would do the editor of *The Naturalist* no harm to attend a Salvation Army meeting, although I have not much hope for either in their present state of mind—six of one, etc. Before we can get any good out of anything we must first believe there is some good in it. Will the person who brought the bat to the Museum let me know where it was caught ? ' The last sentence seems a bit disconnected, but is helpful. We are not quite sure of the drift of Mr. Mosely's remark. In any case we admit it might do us no harm to attend a Salvation Army meeting, and it would possibly do Mr. Mosley no harm to have a night at the Tivoli ! But I hope we should both feel very much out of our element.

FIELD NOTES.

ENTOMOLOGY.

Cicindela campestris (L.) in Derbyshire.—In the British Association Handbook (Sheffield meeting), 1910, Mr. E. G. Bayford, referring to this beetle, states that 'although usually a common species there are only two localities [*i.e.* within the twenty-mile radius of Sheffield] where it has been recorded, viz., in the higher reaches of the Don valley above Penistone, and at Rossington, near Doncaster.' Both these localities are in Yorkshire. In the Victoria County History of Derbyshire the species is stated to be 'scarce,' only three localities being given, viz., Matlock, Repton and Little Eaton. I am able to add to these Derbyshire records, having found the insect in numbers near Bamford and in Lathkil dale.—J. M. Brown, Sheffield.

Cicindela campestris used to abound on Crosland Moor, near Huddersfield, and on Norland Moor, near Halifax. Whether it still does so I do not know.—G.T.P.

Scoparia atomalis.—Referring to my note as to this species, if it can be considered a species (see *The Naturalist* for August, p. 268), I was aware that many lepidopterists had regarded the above as a variety of the common *S. ambigualis*. I may state, however, that many years ago I sent the late Mr. C. G. Barrett a few insects which I had taken on Blackhills, Wilsden, one of which he said was an undoubted specimen of *S. atomalis*, which at the time he considered a good species. Whether it is a good species I cannot say. It differs from *ambigualis* in point of size, colour, and date of appearance; and he would be a bold person who would be dogmatic enough to assert that he could define when a *variety* became a true *species*. My contention is that if *S. atomalis* is merely a variety it ought to be a named variety.*—E. P. Butterfield, Wilsden.

Cloantha solidaginis (K.) at Bingley.—On the 12th August, I took one *Cloantha solidaginis* at rest on an old wall on Blackhills, near Wilsden, and another on the same wall about three weeks later. The distribution of the insect in this district, and perhaps other parts of Yorkshire as well, is very remarkable. It was first recorded by my brother in 1896, who took one on Harden Moor, and in the same year I took it quite abundantly on Blackhills, and in the following year (1897) it was by no means uncommon at the latter place; subsequently, however, it has been unaccountably scarce until the present year. Has its distribution been so erratic in other parts of its haunts in Yorkshire? The district of Blackhills was well worked from the years 1876 to 1896 without

* It is a named variety—var. *atomalis*. In such a case the original name becomes the varietal name.—G.T.P.

this insect having once been seen, and its sudden appearance in great numbers is a puzzling problem in its economy. Another insect, the small copper butterfly, *Polyommatus phlæas*, which in most manuals is said to be common and generally distributed, I took (one specimen) at the flowers of ragwort in a glade near Bingley Woods, last August, for the first time in this district for forty years; others, I believe, have been taken by my son, Rosse, this year in this district. How are we to account for such phenomena as the above, except in the belief that there exists in some insects a migrational impulse at certain seasons; and I believe this is on a much more extensive scale than what is usually accorded by entomologists. —E. P. Butterfield, Bank House, Wilsden, Bingley, Sept. 6th, 1918.

Cloantha solidaginis, I believe, is always more or less plentiful on the South-west Yorkshire moors, and in some years is very abundant. In my early collecting days, *Polyommatus phlæas* was in my experience quite a rarity in the Huddersfield district, but of late years has become quite common, and this year was more plentiful than I have ever known it. It abounded at Brockholes, and occurred in numbers in many other parts of our district.—G.T.P.

—: o :—

BOTANY.

Malaxis paludosa (Sw.) and Salix herbacea (L.) in North-west Yorkshire.—In August last, I discovered these plants in the neighbourhood of Sedbergh, in v.c. 65. The Bog Orchis grows on a wet moor, about two miles from the town, well within the county and in a locality where, happily, it is not likely to be destroyed. The only West Yorkshire habitat previously known was, I believe, Gulliver's Swamp, near Greenfield (*see* Flora of West Yorkshire, p. 436), but the plant is lost there owing to the construction of a reservoir. The Willow, which I found in fair quantity, and very fine, clothing the Upper Silurian (Coniston Grit) rocks at 2,100 ft. on Cautley Crag, has long been recorded for Mid-west Yorkshire from Whernside, Ingleborough and Penyghent, but does not appear to have been noticed before in v.c. 65.—Albert Wilson.

—: o :—

BIRDS.

Pied Redwing.—On March 18th I saw near Bridgnorth a Pied Redwing, a species which is much less liable to such variation than either the Thrush or Blackbird. It was one of a large and very wild flock, but it appeared to have a white tail and primaries. It was very noticeable when on the wing.—(Miss) Frances Pitt.

NORTHERN NEWS, etc.

We have been expecting it for some time, and now *The Animal World* for September has got it—a paper on Nature's *Camouflage*.

The late G. C. Crich's notes on a Deformed Ammonite from the Chalk (Kent) appear in *The Proceedings of the Geologists' Association*, Vol. XXIX., part 2.

We regret to record the death of Mrs. Emily Miall, wife of Professor L. C. Miall. Formerly Mrs. Miall took a keen interest in the University of Leeds and its work.

The 'Report on Scottish Ornithology in 1917, including Migration,' by E. V. Baxter and L. J. Rintoul, entirely occupies a double number of *The Scottish Naturalist* recently issued.

Mrs. Nelson, widow of the late Mr. Thomas H. Nelson, M.Sc., of Redcar, author of 'The Birds of Yorkshire,' has presented the whole of Mr. Nelson's collection of birds and eggs, and also his ornithological books to the Dorman Memorial Museum at Middlesbrough.

Professor F. W. Oliver, of the University College, Gower Street, London, is appealing for helpers to collect Carrageen (the seaweeds *Chondrus crispus* and *Gigartina mamillosa*) to provide jellies for the Red Cross Hospitals. Judging from Dr. Irving's notes in our last issue, Yorkshire is already helping.

We learn from *The Museums Journal* that the Zoological Department of the British Museum 'is doing its best to make the home public utilise cetacean flesh; members of the staff enjoyed steaks cut from a dolphin stranded at Battersea some time ago, and the Lord Mayor, to whom a cut was sent, *audibly smacked his lips over it in the presence of reporters*.'

Vol. II., part 2, of the *Transactions of the Yorkshire Numismatic Society* (A. Brown & Sons, Hull, 3/-) contains papers on 'Discovery of a Small Hoard of Lincolnshire Seventeenth Century Tokens,' 'The Evolution of Shipping as illustrated on Coins and Tokens' and 'Yorkshire and Lincolnshire Seventeenth Century Tokens,' by T. Sheppard; 'The Alford Treasure Trove,' by W. Martin, LL.D.; Detailed Reports on the Society's work during 1916 and 1917, by J. Digby Firth; Numismatic Notes, by the Editor, who also adds a reprint of his paper given to the British Association for the Advancement of Science, on 'Money Scales and Weights.' There are several illustrations.

We learn from *The Yorkshire Post*, of August 27th, that 'During a thunderstorm which took place at Sunderland last week-end, a "rain" of fish occurred in the Hendon district. The area covered included parts of several streets, within a radius of about 100 yards. The fish lay from 20 to 30 to the square yard, and were of a kind known locally as "sile," being in shape like a small eel, and varying in length from two to three inches. They appeared to be all dead when they fell. It is supposed they had been drawn up from the sea in a waterspout. The incident caused considerable comment in the neighbourhood. The spot where they fell is a few hundred yards from the sea shore.'

We have received the following post-card:—'From the Curator, Public Museum and Mappin Art Gallery, Sheffield.—Sorry to see what a pitiable state you were in. Hope you have recovered from your convulsions and painful incoherent gaspings. How very hard hit you seem to have been, and those concerned never had a thought of you in their minds—which they like to keep clean. Try to bear up. Do the initials stand for the Muddy Shepherd I read about.' Our friend at Sheffield has some reputation as a writer of post-cards, but in this case we are a little in the dark, unless reference is made to the account of a Sheffield Conference which appeared in our journal for August. Anyway, we have had nothing which would make us write a card like that for months and months: we can't afford it at 9/- a bottle!

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October 1st, 1918.

NOV. 1918. No. 742
(No. 516 of current series.

THE NATURALIST

A MONTHLY ILLUSTRATED JOURNAL OF
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EDITED BY
T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
THE MUSEUMS, HULL;
AND
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WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
J. GILBERT BAKER, F.R.S. P.L.S., GEO. T. PORRITT, F.L.S., F.R.S.,
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RILEY FORTUNE, F.Z.S.

Smithsonian Institution
JUN 24 1920
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YORKSHIRE NATURALISTS' UNION.

VERTEBRATE SECTION

THE usual meeting on the third Saturday in November is abandoned, and the election of Officers and other business will take place at a meeting to be held half an hour before the meeting of the General Committee at the annual gathering of the Union, at Leeds, on **Saturday, December 7th, 1918.**

WALTER GREAVES, *Hon. Sec.*

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Discovery. (Liverpool, 4to). 1891.
Derby Arch. and Nat. Hist. Soc. Parts 20, 21.
Devonshire Assoc. Adv. Science. Vols. I., II., III., XXXV., 47-
Dublin Geol. Soc. Vol. I., pt. 1, 1830?; Vol. VII., 1855-9.
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Geol. Soc., London, Trans. 4to. 2nd series, Vols. IV.-VII., Pts. 1-3 (1836-52).
Geol. Soc. Quarterly Journal. Vols. I.-II.
Geological Magazine, 1890-1-2-4.
Huddersfield Arch. and Topog. Society. 1st Report, 1865-1866. (38 pp.).
Illustrated Scientific News. 1902-4. (Set).
Journ. Micrology and Nat. Hist. Mirror. 1914—
Keighley Naturalists' Society Journal. 4to. Part 1.
Lancs. and Cheshire Antiq. Soc. Vols. IV., V., VIII., XXVI.
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NOTES AND COMMENTS.

SPLITTING OF COAL SEAMS

In the Transactions of the Institution of Mining Engineers, Vol. LIV., pt. 5, Prof. P. F. Kendall has a paper 'On the Splitting of Coal-seams by Partings of Dirt. Part I.—Splits that rejoin.' He states :—The splitting of coal-seams by the intercalation of wedges or lenses of sedimentary material offers one of the most disconcerting problems confronting the mining engineer. There is probably no important seam in the great midland Coalfield but exhibits the phenomenon in one or another of its forms. Two types of split can be recognized. One type had its cause and origin in local depressions of the original area of coal-accumulation, converting it from a condition of swamp-forest unto actual lagoon, thereby drowning the contributory plants and arresting further growth until the deposition of sediment had again built up a platform upon which the vegetation could re-establish itself. They may be termed 'tectonic splits'—that is, splits brought about by earth-movements.

AND THEIR CAUSES.

After carefully reviewing the evidence, he concludes that :—

(1) That linear splits in coal-seams that rejoin are usually erosion phenomena, and not, as Bowman supposed, tectonic in origin.

(2) That the common phenomenon of the arching of the upper portion of the seam over the dirt-parting is the result of the relative incompressibility of the sedimentary material.

(3) That the Whitwood-Ackton Hall Split marks the course of a stream traversing the area during the formation of the "Silkstone' (Middleton Main) Coal.

(4) That the stream was probably the same as that of which traces are found at Allerton Bywater, and possibly the same as that at Woodlesford, Swillington and Newsam Green, but probably not that at Colton.

(5) That the split at Wheldale and Fryston is of somewhat earlier date than the Whitwood Split, and that, if of the same type, it is on a vastly larger scale.

The discoidal splitting at Water Haigh was due, the writer believes, to a different cause, but the infilling was accomplished by the overflow of muddy water from the adjacent river.

AGRICULTURAL PESTS.*

In this excellent report the author has very thoroughly considered the subject from all points of view and no doubt

* *Report on Agricultural Damage by Vermin and Birds in the Counties of Norfolk and Oxfordshire in* 1916. By R. T. Gunther, M.A., F.Z.S. Oxford University Press. 92 pp., 2/6 net.

much that applies to the two counties investigated also applies to other areas. He considers that the services rendered to man by rats and sparrows, which cannot be epually well performed by other and less destructive animals, are so inconsiderable in proportion to the mischief done that the total extermination of both pests would be attended with excellent economic results. Pigeons and rabbits are unmitigated pests on the farms, but have a food value for which they merit a certain consideration.

ROOKS, STARLINGS AND PHEASANTS.

Rooks, starlings and pheasants resemble one another in that they are all friends of the farmer's up to a certain point, after which they become his enemies. All hinges on the abundance or scarcity locally of their favourite animal food. The starling is an elusive character; one moment he is a red-handed criminal, in the next he is the saviour of the farmer's pest-ridden crops. Starlings are undesirable in the nesting season, when they rout woodpeckers, wrynecks and other wholly useful birds out of their nesting places. The pheasant in moderation, on the score of his superior food-value, is entitled to a fair share of agricultural produce. The farmer's best friends are birds like the peewit, which are wholly insectivorous and will under no circumstances take to eating grain.

THE PROBLEM OF MAN'S ANCESTRY.*

Under this heading Prof. Wood-Jones has published his lecture which received so much notice in the press at the time. We have read it carefully, but are not converted. He considers, with Klaatsch, that "the monkeys and apes are to be best regarded as degenerated branches of the pro-human stock,' and 'it is for those who hold an opposite belief to show us how the bodily primitiveness of some Tarsius-like creature can have progressed into the stage of simian specialization, and then, after long ages, relapsed into an identical primitiveness such as characterizes man.'

MAN'S ORIGIN.

He concludes:—Man is no new begot child of the ape, born of a chance variation, bred of a bloody struggle for existence upon pure brutish lines. Such an idea must be dismissed by humanity, and such an idea must cease to exert any influence upon conduct. We did not reach our present level by these means; certainly we shall never attain a higher one by intensifying them. Were man to regard himself as being an extremely ancient type, distinguished now, and differentiated in the past, purely by the qualities of his mind, and were he to regard existing Primates as misguided and degenerated failures of

* By Prof. Frederick Wood-Jones. London: S.P.C.K. 48 pp., 7d. net.

his ancient stock, I think it would be something gained for the ethical outlook of humanity—and it would be a belief consistent with present knowledge.

BIRDS AND EGGS.

The Secretary of the Yorkshire Naturalists' Union Wild Birds' Eggs Protection Committee, has received the following letter from the County Hall, Wakefield :—'The Ingleton Parish Council have written that there seems to have been a wanton destruction of all kinds of birds' eggs both in 1917 and 1918, especially of plover. That farmers are lately complaining about the heavy damage by the innumerable caterpillars this spring both to the foliage of trees and grass land, and make no hesitation in saying that the destruction of birds' eggs and the shooting of all kinds of winter birds is responsible for the plague. The Parish Council ask that the Close Time for killing of plover should be extended throughout the year and that eggs of all birds should be protected. At present plovers' eggs may be taken up to the 15th of April. The view has been placed before the County Council that the destruction of plover, which are extremely numerous and form an important article of food, is comparatively small as they are difficult to shoot in the winter and netting is seldom resorted to in this country. As regards their eggs, it is a well attested fact that although they do not continue to brood a fresh clutch of eggs at intervals during the months of April, May and June, as long as these are collected. The result is that under the present measure of September to after the 15th April they may be practically relied upon to rear a brood of young during the spring or summer.'

PLOVERS' EGGS.

'That, as a matter of fact, the taking of their early eggs is often a blessing in disguise, as owing to the absence of herbage and the prevalence of late frosts in the early spring, both eggs and young run far more risk of destruction at this season than at a later date. Also, that the majority of plovers, which nest on the high ground at Ingleton, resort in vast lots during the winter to the low land and estuaries where food is more plentiful. The West Riding General Purposes Committee are considering whether further protection should be extended to plovers and their eggs, and they will be glad if the Yorkshire Naturalists' Union have any evidence as to the destruction of plover and the reduction in their numbers and their influence upon the plague of caterpillars.' If any of our readers have any remarks to make upon the question, perhaps they will communicate with Mr. Johnson Wilkinson, Vermont, Huddersfield.

MAKING OF YORKSHIRE.*

This is essentially a scientific and scholarly work, and in our opinion far exceeds in value any of the numerous interesting volumes with which Mr. Fletcher has previously favoured his readers. By the aid of old maps, plans and histories, and a thorough knowledge of his county and its progress, the author has sketched the evolution of Yorkshire and its towns, trades, industries, farming and other operations. He shows in a surprising manner how many of our greatest manufacturing centres have come into being in quite recent times only, and that less than a century and a half ago a vast agricultural or common land was dotted over with small industrial centres, and he shows how, step by step, many of these have merged into an area which more resembles one great town. His chapter on 'Yorkshire in 1750' is a picture remarkably well-drawn and devoid of the inaccuracies so often found in pseudo-popular works. He deals with Communication and Transit; Power and Machinery; Coal, Iron, Steel; Textiles; Agriculture; Religion; Education, and so on. The present writer would like to take this opportunity of thanking Mr. Fletcher for the various flattering references made to his work and writings, and is happy to think that in some small way he has assisted the author in producing such an excellent work as 'The Making of Modern Yorkshire.'

CARBONIFEROUS GONIATITES.

We are glad to see that Dr. Wheelton Hind is continuing his studies of Carboniferous fossils, a subject which formed the theme of his valuable contributions to this journal a little while ago. In *The Geological Magazine* for October, he has a paper 'On the Distribution of the British Carboniferous Goniatites, with a Description of one New Genus and some New Species.' He gives reasons for assuming that the localities 'Halifax' and 'Todmorden' on many important specimens in the British Museum, are not reliable. His paper contains Notes on each species of Carboniferous Goniatites, with Distribution and Localities. The new Genus described is named *Sagittoceros*, and the new species are *Sagittoceros acutum*, from Craven; and *Pericyclus redesdalensis*, from Northumberland. There is a plate of figures.

CAPT. H. V. CORBETT.

We much regret to observe the following announcement in the press:—'Capt. H. V. Corbett, Cambridgeshire Regt., attached Essex Regt., only son of Dr. H. H. Corbett, Thorne

* 'The Making of Modern Yorkshire, 1750-1914.' By J. S. Fletcher. London: George Allen & Unwin. 328 pp., 7/6 net.

Road, Doncaster, was killed in action on October 17th, at the age of 25. When war broke out he was a member of the Cambridge University O.T.C., and he went straight into the Army.' Captain Corbett will be remembered by many of our readers. He was an enthusiastic naturalist, frequently attended the meetings of the Yorkshire Naturalists' Union and the pages of this journal have been enriched by his notes, and records. Some time ago he was invalided home badly wounded in the shoulder. We extend to Dr. Corbett our sincere sympathy on this, his second serious sorrow.

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The Stars and How to Identify Them, by **E. W. Maunder.** London: C. H. Kelly, 64 pp., 1/6 net. This is an excellent treatise, well written and illustrated by 27 Diagrams or 'maps,' which are clearly explained.

Methods in Practical Petrology, by **H. B. Milner** and **G. M. Part.** Cambridge: W. Heffer & Sons, 68 pp., price 2/6 net. This is a volume of 'Hints on the preparation and examination of rock slices,' and is intended to act as a practical companion to the standard Petrological text-books. The book is in five parts, dealing with the 'Preparation of Rock Slices,' 'Examination of Rock Slices,' 'Microchanical Methods (Staining),' 'Mounting of Sands and Crushed Rock Material,' and 'Preparation of Stains.' There are several useful diagrams and tables.

The Life and Letters of Sir Joseph Dalton Hooker, O.M., G.C.S.I., by **Leonard Huxley.** London: John Murray, 2 vols. (pp. 546-569), 36/- net. It is a glorious thing in these times to find that two such handsome volumes can be published, and we sincerely trust that the venture may amply reward both author and publisher. Every scientific man knows of J. D. Hooker and his work as a botanist, evolutionist, traveller and explorer; all know the important position he holds in the scientific world, but these two volumes give an account of a life's work, the magnitude and value of which must be astounding, even to those who were intimately associated with Sir Joseph. His work at Kew is alone a sufficient monument to his memory, but even that fades into insignificance when one reads of his extraordinary contributions to botanical science, to his explorations in the Antarctic, the Himalayas and the Atlas; and to the prominent part he played in connection with the valuable work on evolution published by his intimate friend and correspondent, Charles Darwin. For Hooker was an untiring worker, and 'apart from a vast official correspondence and regular weekly letters to various members of his family, there are extant over 700 sheets copied from his letters to Charles Darwin, whose own share of the correspondence, typed out, fills more than 800 pages.' The list of Hooker's contributions to science (19 pp.) is almost like a library catalogue, even though it is remembered that his first essay was written at 19 and his last at 94!; while his 'list of Degrees, Appointments, Societies and Honours,' occupying 11 pages, is probably by far the most that have been conferred upon any scientific man, living or dead. Among the enormous amount of material available, Mr. Leonard Huxley has doubtless had considerable difficulty in selecting. But his selection has been good. The account he gives of Hooker's work, and the letters which are reproduced, form a magnificent record of botanical science during the great century; and in this progress, Hooker was at the helm. There are many side-lights on botanical history in the volumes which botanists will find difficult to obtain elsewhere. And the portraits, views, and maps considerably add to the value of one of the most interesting biographies that have appeared in recent years.

LIST OF MARINE MOLLUSCA OF ICELAND.

HANS SCHLESCH.
Hellerup, Denmark.

I. GASTEROPODA.

1. PROSOBRANCHIATA.

(*a*) *Placophora.*

Chiton (*Lophyrus*) *albus* Linné.
* „ (*Lepidopleurus*) *arcticus* G. O. Sars.
* „ (*Craspedochilus*) *marginatus* Pennant.
„ (*Boreochiton*) *ruber* Lowe.
„ „ *marmoreus* Fabricius.

(*b*) *Cochleata.*

Nacella pellucida Linné.
Acmaea testudinalis Müller.
„ „ var. *pallida* Verkrüzen.
Tectura rubella Fabricius.
„ *virginea* Müller.
„ „ var. *lactea* Jeffreys.
Lepeta caeca (Müller).
Puncturella noachina (Linné).
**Scissurella crispata* Fleming.
Moelleria costulata (Möller).
Gibbula tumida (Montagu).
Margarita cinerea (Couthouy).
„ „ var. *striata* Broderip & Sowerby (=var. *grandis* Mörch).
„ *helicina* Phipps.
„ *groenlandica* (Chemnitz).
„ *vahli* Möller.
„ *olivacea* (Brown).
„ *obscura* Couth.; var. *islandica* Odhner.
Capulus hungaricus Linné.
* *Velutina lanigera* Möller.
„ *laevigata* Pennant.
„ *cryptospira* Middendorff.
„ *capuloides* Beck.
**Morvillia zonata* Gould.
Pilidium radiatum (M. Sars).
Marsenia micromphala Bergh.
* „ *groenlandica* (Möller).
**Onchidiopsis groenlandica* Bergh.
„ *reinhardi* Beck.
**Amaura candida* Möller.

* Species doubtless living in Iceland, but as far as I know not yet found there.

Amauropsis islandica (Gmelin).
**Ampullina smithi* Brown.
Lunatia nana Möller.
,, *groenlandica* Beck.
Natica affinis (Gmelin) (= *N. clausa* B. and S.).
,, (*Lunatia*) *montagui* Forbes.
,, ,, *borealis* Gray.
Trichotropis borealis Broderip & Sowerby.
* ,, *conica* Möller.
* ,, *bicarinata* Broderip & Sowerby.
Bela exarata (Möller).
,, *linearis* Montagu.
,, *nobilis* (Möller).
,, ,, var. *turricula* Montagu.
* ,, ,, var. *assimilis* G. O. Sars.
* ,, ,, var. *scalaris* (Möller).
,, *cinerea* (Möller).
,, *elegans* (Möller).
,, *declivis* (Lovén).
* ,, *decussata* (Couthouy).
* ,, ,, var. *viridula* Möller (= *B. kobeliti* Verkrüzen).
,, *trevelyana* (Turton).
,, *pingeli* (Beck).
,, *bicarinata* (Couthouy).
,, ,, var. *cylindracea* Möller.
,, ,, var. *violacea* (Mighels).
,, ,, var. *simplex* Middendorff.
* ,, ,, var. *laevior* G. O. Sars.
* ,, ,, var. *rufescens* G. O. Sars.
,, *pyramidalis* (Ström).
,, ,, var. *gigantea* Mörch.
,, *rufa* Montagu.
,, *tenuicostata* (M. Sars).
,, *obliqua* G. O. Sars.
* ,, *sarsi* Verrill.
,, *cancellata* (Mighels).
,, *rugulata* Troschel.
,, ,, var. *bergensis* Friele.
,, ,, var. *scalaroides* G. O. Sars.
,, *harpularia* (Couthouy).
,, *angulosa* G. O. Sars.
Nassa incrassata Ström.
Astyris rosacea (Gould).
Volutomitra groenlandica (Beck).
Admete viridula (Fabricius).
Purpura lapillus (Linné).
,, ,, var. *imbricata* Lamarck.
Trophon craticulatus (Fabricius).

Trophon truncatus (Ström).
,, *costatus* His.
,, *clathratus* (Linné).
,, ,, var. *gunneri* Lovén.
Sipho (*Siphonorbis*) *tortuosus* Reeve.
,, ,, ,, var. *turritus* (M. Sars).
,, ,, *gracilis* da Costa.
* ,, ,, *dalli* Friele.
,, ,, *undulata* Friele.
,, ,, *lachesis* Mörch.
* ,, ,, *ebur* Mörch.
,, (*Tritonofusus*) *latericeus* Möller.
* ,, ,, *kröyeri* Möller.
,, *islandica* (Chemnitz).
Volutopsis norvegica (Chemnitz).
**Chrysodomus turtoni* (Bean).
**Neptunea borealis* Philippi.
,, *despecta* (Linné).
,, ,, var. *fornicata* (Fabricius).
,, ,, var. *carinata* Lamarck.
,, ,, var. *tornata* Gould.
Buccinum undatum Linné.
,, ,, var. *littoralis* G. O. Sars.
,, ,, var. *caerulea* G. O. Sars.
,, ,, var. *pelagica* G. O. Sars.
,, ,, var. *planum* Verkrüzen.
* ,, *belcheri* Reeve.
,, *terrae-novae* (Beck).
,, *zetlandicum* Forbes.
,, *groenlandicum* Chemnitz.
,, ,, var. *perdix* Beck.
,, ,, var. *tenebrosa* Hancock.
,, ,, var. *patula* M. Sars.
,, ,, var. *sericata* Hancock.
,, ,, var. *major* Posselt.
,, *finmarchianum* Verkrüzen.
,, ,, var. *lutea* Posselt.
,, ,, var. *sarsi* Pfeffer.
,, ,, var. *scalaris* G. O. Sars.
,, ,, var. *attenuata* G. O. Sars.
* ,, ,, var. *carinata* Posselt.
* ,, ,, var. *wandeli* Posselt.
,, ,, var. *persulcata* Posselt.
(= *B. humphreysianum* Möller).
,, *hydrophanum* Hancock.
* ,, ,, var. *elata* Friele.
* ,, ,, var. *tumidosa* Posselt.
* ,, ,, var. *percrassa* Posselt.

* *Buccinum hydrophanum* var. *texturata* Posselt.
* ,, ,, var. *fusco-rufescens* Posselt.
,, *ciliatum* Fabricius.
,, *tenue* Gray.
,; *glaciale* Linné.
* ,, *parvulum* Verkrüzen.
* ,, *fragile* Verkrüzen.
* ,, *conoideum* G. O. Sars.
* ,, *pulchellum* G. O. Sars.
* ,, *tumidulum* G. O. Sars.
* ,, *amaliae* Verkrüzeu.
* ,, ,, var. *elongata* Verkrüzen.
* ,, *undulatum* Möller.
Aporrhais serresianus Michaud.
,, *pes-pelicani* Linné.
Cerithiopsis costulata (Möller).
**Turritella reticulata* Mighels & Adams.
* ,, *erosa* Coutnouy.
,, *ungulina* Linné.
**Turritellopsis acicula* (Stimpson).
**Homalogyra atomus* (Philippi).
Skenea planorbis (Fabricius).
**Eulima stenostoma* Jeffreys.
**Liostomia eburnea* (Stimpson).
Odostomia insculpta Montagu.
,, *unidentata* Montagu.
Rissoa (*Cingula*) *arenaria* Mighels & Adams.
,, ,, *castanea* Möller.
,, ,, *globulus* Möller.
,, ,, *pella* Linné.
* ,, (*Alvania*) *scrobiculata* Möller.
,, ,, *cimicoides* Forbes.
,, ,, *jan mayeni* Friele.
,, (*Onoba*) *aculeus* (Gould).
,, ,, *striata* J. Adams.
,, ,, *saxatilis* Möller.
Lacuna pallidula (Da Costa).
* ,, *crassior* (Montagu).
,, *divaricata* Fabricius (= *L. vincta* Mont.).
,, ,, var. *canalis* Montagu.
,, ,, var. *cornea* Brown.
Littorina obtusata Linné.
,, ,, var. *fabalis* Turton.
,, *palliata* (Say).
,, ,, var. *elatior* G. O. Sars.
,, ,, var. *turritella* Schlesch.
,, ,, var. *carinata* Schlesch
(=var. *angulata* M. Sars ?).

Littorina palliata var. *auricularia* Schlesch.
,, ,, monstr. *coarctata* M. Sars.
,, *rudis* Maton.
,, ,, var. *groenlandica* Menke.
,, ,, var. *conoidea* Schlesch.
Scalaria (*Acirsa*) *borealis* Beck.
,, *groenlandica* (Chemnitz).
**Menestho albula* (Fabricius).

2. Opisthobranchiata.

Scaphander puncto-striatus Mighels & Adams.
,, *librarius* Lovén.
Diaphana (*Amphisphyra*) *expansa* (Jeffreys).
,, ,, *hiemalis* (Couthouy).
,, ,, *hyalina* (Turton).
Chactoderma nitidulus Lovén.
Actaeon tornatilis Linné.
Utriculus pertenuis (Mighels).
,, ,, var. *turrita* Möller.
Cylichna reinhardti Möller.
,, *scalpta* (Reeve).
,, *alba* (Brown).
,, ,, var. *corticata* Möller.
,, *sarsi* Phil.
Philine lima (Brown).
,, *quadrata* (Wood) (=*P. scabra* Müller).

3. Nudibranchiata.

Æolis papillosa Linné.
Polycera (*Palio*) *ocellata* Alder & Hancock.
Limapontia islandica Steenstrup.
Ancula cristata Alder & Hancock.
Cratena olriki (Mörch).
Coryphella salmonacea (Couthouy).
,, *bostoniensis* Bergh.
Dendronotus arborescens (Müller).
,, *robustus* Verrill.
Lamellidoris bilamellata (Linné).
,, *inconspicua* Alder & Hancock (= *L. oblonga* A. & H.?).
Acanthochila laevis Linné.
Cadlina repanda (Alder & Hancock) (=*C. obvelata* Müll.).
Acanthodoris pilosa Müller.
Caudiella ingolfiana Bergh. (61° 44′ Lat. N., 27° ₀₀ Long. W. Ingolf Exp., Stat. 81, 485 faths.).
Atthila ingolfiana Bergh (62°₀₀ Lat. N., 21° 36′ Long. W. Ingolf Exp., Stat. 40, 845 faths.).

(*To be continued*).

ORNITHOLOGICAL OBSERVATIONS AND REFLECTIONS IN SHETLAND.

EDMUND SELOUS.

(*Continued from page 320*).

In ' The Saturday Review,' of August, 1st, 1903, I wrote as follows, the subject of my article being not Kittiwakes, but Terns :—' One of the most marked and curious of these effects is a sudden lull or hush which sinks, as it were, without any imaginable reason, on the Bank,* and the air above it, that have just before been a deafening babel of shrieking and discordant sounds. Sometimes this hush is so marked that there seems almost to be actual silence, for a few seconds, then the voices gradually rise again, and there is soon the same hubbub as before. Then, in another two or three minutes, there is another marked subsidence, after which the noisy fit may last so long and seem so permanent that one begins to think one must have been mistaken in imagining that there was ever any surcease of it. But, all at once, as though a word had been spoken or a finger lifted, in warning, there falls, again, upon the whole clamorous community, that odd, awed hush, like a sudden dropping of the wind. It is as though some unseen presence—unseen to you, at least—had passed amidst the birds, making them wonder, if not fear, for a moment, in which moment they forgot to scream. I have noticed the same thing with Rooks, when waiting in their roosting-woods for the night to fall, and with Starlings both in the evenings and mornings. Here, on the Bank, it is mostly towards the close of the day that the thing impresses itself upon one. When I say that there is no imaginable reason for it, I mean, of course, in comformity with what is known and admitted, and that I can imagine none. With the Starlings I used to suppose, as in duty bound, that an Owl or a Hawk was at the bottom of it, and I have, in fact, seen the former bird produce something of the same effect, as it passed silently along, above the dark and crowded thicket. But, instead of a hush, what a most prodigious—what a clamour-out-clamouring clamour would have arisen, and what active and violent hostility would have been displayed, had a Hawk or Owl, or even, I verily believe, had an Eagle come amongst this multitude of Terns.† Clearly, this class of reason is here excluded, as it is, almost equally, with the Rooks. The coming on of night, again, might produce—as indeed it does—a gradual—though

* The Chesil Bank.

† This surmise has since been justified by what I saw in Iceland of the mobbing of Eagles by only some half-dozen Gulls or so. A pair of Merlins will also pursue and pester them remorselessly.

it is a very gradual—softening of the voices, but why should silence fall thus suddenly, at intervals, and this, too, at a time when, though, by the clock, it may be called evening, no feather of darkness has yet floated ' from the wings of night ? ' In short, there is no apparent reason : some mood of mind, beyond one's human grasp or understanding, has swept, as a breath of wind, through the bird army, acting like a command.

Thus, fifteen years ago, I put a fact upon record, which I could not, then, and am still unable to explain orthodoxly, though, in doing this, it never, for one moment, occurred to me that I was not acting quite fairly by orthodox science, supposing, as I did and had reason to, that to bring the matter, thus, to public and popular notice, was the surest way of hushing it up. Conceive my surprise when, in a work on ornithology, published only a year afterwards, I found my observations referred to, and others, of a similar kind, brought forward in confirmation. The work in question is Mr. Henry J. Pearson's ' Three Summers amongst the Birds of Russian Lapland,' * and he gives his experience as follows :—' As we lay ' (the author and his brother) ' watching some bird to its nest, suddenly without the slightest apparent cause, the babel of voices ceased, and every bird in sight, Terns, Gulls, Skuas, even some of the Ducks, would rise into the air in silence, wheel about, several times, and then return with redoubled chatterings. We were the only human beings on the island, at the time ; nor were there any other large mammals there, or birds of prey. No signal was perceptible ; it was as if an electric shock touched them simultaneously. Sometimes these peculiar movements took place at intervals of less than ten minutes.'† In regard to the numbers of the birds affected by this simultaneous impulse—we have seen that they included several species—Mr. Pearson writes : ' Arctic Terns were now nesting in thousands in all directions—on the wet sphagnum-moss in the marshes, on the crowberry covering the higher ground, and among the shingle of the shore, so that when it is remembered that the island meaures four miles each way, and that no part was really free from breeding birds, although they were certainly much thicker in some places than others, it will be clear that " thousands " is not an exaggeration.'‡ Here the sudden silence, though it must have been very striking, was, perhaps, no more than an ordinary incidence of the rising in flight, or, at any rate, have had something to do with this. But the one thing is as hard to explain as the other, and the conditions prevailing—the numbers and

* R. H. Porter, 1904.

† p. 33.

‡ p. 32. I should hardly think it would be an exaggeration as applied to the Terns which I watched.

mixture of species of the birds, with the wide space over which they were distributed, the remoteness, too, of the island and its being untenanted either by man or other predatory animals, make the observation a very remarkable one. Moreover, the writer had observed it before, in 1901, which establishes the habitual character of the phenomenon. Mr. Pearson says that no signal was perceptible, but what signal, or purpose for a signal, can we possibly imagine? Thousands of birds—Terns, Gulls, Skuas, Ducks—clustered together in a remote, northern island, otherwise uninhabited, most of them incubating, all intent upon, if not actually occupied with their procreant duties. One, amongst them all, steps, or flies forth, and with some special motions of its wings or body, or by a cry, or cries, amidst the great universal one, commands, exhorts, or, in some manner, signifies to this multitude of self-centred beings that they shall all take the air for a few minutes before resettling—or resettles them also—and so repeats, at short, irregular intervals. Is such a thing reasonably conceivable? I say that it is not, and that, if it were the case, birds would not be birds, as we know them, but a sort of non-human entities acting humanly—though, even so, without any conceivable motive—after a fashion that we have no right to postulate.

It may be said, however, that a bird, acting as thus imagined, would be a drill-sergeant, rather than a leader, and that precise signs and signals go beyond merely following the example of some particular chosen individual in all its actions and doings. Since, however, any indifferent member of the flock, or many together, may, at any moment, fly up from it, without the rest being affected, it is less difficult to imagine the attention of the whole flock being caught by some distinctive action on the part of any individual belonging to it, whether deputed or not, than by some special one acting as all act. Nor is it for those who believe in 'hereditary drill,' in birds, to take exception to hereditary drill-sergeants. Quite as untenable, to my mind, both here and according to all my own observations, is the theory of a leader—a single individual who—distinguishable, in some unknown way, by thousands of closely similar individuals from all the other thousands, or, if not, then, without distinction, kept separately in view by all, over a wide, crowded space—has every, or certain of his actions (in themselves quite ordinary), blindly and unanimously followed, even though, so far as is discernible or can be conjectured, these are of no special importance for the welfare either of his own or of other species, also, that consent to be led by him; since, otherwise, we must suppose that each of the species taking part, as one whole, in these movements, has its own leader, and that they all act in concert. Such suppositions appear to me to be absurd, and they rest on no

evidence that rebuts the apparent absurdity. On the other hand, what seems clearly indicated as the cause of this sudden collective action, is precisely the same one, which, in the opinion of some men eminent in varous branches of science, as well as of others representing the *mens sana* order—the whole now a very large body—has been proved upon the evidence, both spontaneous and experimental, to be a factor in human psychology. Thus two lines of evidence, widely different—nothing, I think, is more different from psychical research, of the ordinary kind, than field natural history—converge and support one another, a fact, the significance of which it would not be easy to over-estimate.

The fact would seem to be this. Physiologists have demonstrated that special sense organs exist, and not being in the possession of evidence to show that such perception as is imparted to living beings through special sense-organs, or any other kind of perception, can be otherwise conveyed, have concluded, on the ordinary principle of seeing's believing, that no other is or can be so conveyed. But physiologists have interrogated nature in the laboratory, and have not specially interested themselves in control questionings outside it. Had part of their province been the study of free animal life, amidst its natural surroundings, and had they, thus, of their own observation and discovery, become acquainted with the phenomenon of simultaneous movement amongst large bodies of birds, they would, probably, in many cases, have been as puzzled to conceive of them as due to impressions received through the special sense organs of sight, hearing, touch, taste or smell, as are Mr. Pearson and myself—to go no farther. This inability to explain them would have raised a doubt as to whether they could be so explained, and such doubt having arisen in a way, and through a channel, calculated to impress physiologists, would have got into the physiological text-books, and the bounds of orthodox science have been thereby a little enlarged. It may, perhaps, seem 'a wild surmise,' but to me it comes disguised as a necessity, that the special perceptions received through their corresponding sense-organs were founded on some more generalised kind of perception, which existed before these even began to be separately developed; but, setting aside first origins, there was probably something on which each of these structures grew up, the existence of which, if they never had done so, could only have been conjectured through observation of the activities of the being not possessing them. Further, this something, though inferior, we must suppose to have been of the same essential nature as that which the structure, if present, would have assisted.

(*To be continued*).

THE SPIDERS OF YORKSHIRE.

WM. FALCONER,
Slaithwaite, Huddersfield.

(*Continued from page 324*).

Gen. *Scotophæus* Sim., 1-1.

S. blackwallii Thor. (*Drassus blackwallii*).

A house-frequenting spider, sometimes found wandering on the walls and ceilings of rooms and outhouses, or in crannies of walls; reported from eight widely separated English counties, Edinburgh and Leinster; abroad it is rare, occurring in France, under bark and in wall crevices, and in Austria and Hungary. *Adult*, ♂ May and June, ♀'s linger on to late summer and autumn. First occurrence—T. Stainforth, Rye Hill, near Hull, June, 1908

V.C. 61.—Rye Hill, one ♂, one ♀, T. S.; Bubwith, immature ♀, J. F.

V.C. 62.—Marske, adult ♀, in cranny of external wall of an outhouse in St. Germain's Lane.

V.C. 63.—Lidgett Green, near Bradford, immature ♂, T. St.

Fam. THERIDIIDAE. 20-47,
Gen. *Episinus* Walck., 1-2

E. truncatus Walck.

All British examples were referred to this aggregate until the Rev. O. Pickard Cambridge* showed that there were two species included under this name in Britain, the other being *E. lugubris* Sim., and that they are almost equally distributed. An adult is needed to allocate the undermentioned specimens to its segregate. *Episinus* is very rare in Ireland, much commoner in the south of Great Britain than in the north, but extending into Scotland; widely distributed in Europe. *Adult* in summer.

V.C. 64.—Linton Common, June, 1903, an immature ♂ beaten from furze.

Gen. *Theridion* Walck, 10-17.

T. sisyphium Clerck.

A common and vividly marked spider on holly, furze, bramble, etc., with a very wide range in the British Isles and on the Continent, *Adult* April to August. First record—S. G. B. I. Widely diffused through the county, but recorded stations few or none in the hillier districts of the west. Infrequent in the Huddersfield area, Bury Mill and Royal Clough, Scammonden; but Lepton Common, abundant on furze.

T. impressum L. Koch.

Very much resembling the last, but less vividly marked, this spider escaped notice as a British species until 1903,† but is now on record for Warwickshire, Dorset, Hereford, Cheshire and the Grampians; abroad, noticed in Holland and South Russia. Season as in *T. sisyphium* Clerck.

V.C. 61.—Riccall Common, an adult ♂ in company with a number of immature examples, presumably of the same species, June 3rd, 1911.

V.C. 63.—Martin Beck Wood, one ♂, June, 1917, C.

T. vittatum C. L. Koch. (*pulchellum* Walck.).

Common in the south of England, but rare in the north and in Ireland; not yet noted for Scotland and with a very wide distribution on the Continent, extending to Central Asia, Siberia and Japan; beaten from bushes and trees. *Adult*, May and June. First occurrence—the author, Woodhall, June, 1903.

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* 'New and Rare British Arachnida': *Proc. Dorset F. Club*, 1906.

† Rev. O. P. Cambridge, in *Proc. Dorset F. Club*, 1903, Vol. XXIV., p. 162.

V.C. 63.—Askern, both sexes.

V.C. 64.—Woodhall bridge, a few each of sex; Harewood Park, near the lake, one ♀; Y.N.U. Bishop Wood, several ♀'s.

T. denticulatum Walck.

With a wide British and Continental range, extending to Syria, North Africa and the Azores; Isle of Man, 1908; usually common in crevices of bark and on bushes. *Adult* May and June, ♀'s also later. First occurrence—the author, Roundhay, near Leeds, August, 1898. Very widely diffused in the county, but records are few in V.C. 62, and it is uncommon in the Huddersfield area. Probably commoner than its noted occurrences would seemingly indicate.

V.C. 65.—Tanfield.

T. simile C. L. Koch.

Rare in Ireland, Scotland and the north of England; commoner in the south, and with a very wide European range, and extending to Syria. *Adult* April to July.

V.C. 62.—Goathland, two examples beaten from furzes near the station, August, 1906.

T. varians Hahn.

Very widely distributed in the British Isles and on the Continent, extending to south Russia and Siberia; usually common on shrubs and trees. Probably more abundant in Yorkshire than the records show, in gardens and laid-out parks. *Adult* May to July. First occurrence—the author, Scampston, August, 1906.

V.C. 61.—Hornsea Mere, E. A. P., T. S.; Hessle, E. A. P.; East Park, Hull, H. C. D.; Scampston Park, ♀s.

V.C. 62.—Scarborough, H. C. D.; Egton, W. P. W.

V.C. 63.—Whetley Hill, Bradford, F.; garden, Moorhead, W. P. W.; Slaithwaite, plentiful in ivy overhanging a private road.

V.C. 64.—Bishop Wood (Selby) ♀; Linton Common, ♀s.

T. pictum Hahn.

A distinctly marked species, found in many localities in Great Britain and usually abundant where it occurs; in gardens and conservatories and on furze; not yet on record for Ireland, but well distributed abroad. *Adult* May to July. First occurrence—J. Porter, Ellerby, Sep., 1908.

V.C. 61.—Ellerby, J. P.; Preston Lane, both sexes, common, and Skipwith Common, T. S.; Riccall Common, abundant on furze, W. P. W., W. F.

V.C. 64.—Saltaire Park, one ♀ on box, and Bradley Gill (Skipton), one ♀, W. P. W.; Chandler's Whin (York), numerous ♂s and ♀s.

T. tepidariorum C. L. Koch.

World-wide in distribution; introduced into Britain with plants from abroad, and now well-established in old greenhouses. In Yorkshire it will probably be found as elsewhere generally distributed and plentiful in such places. In the south of England as on the continent, some have taken to an outdoor life. *Adult*, summer and autumn. First occurrence—the author, Leeds, July, 1896.

V.C. 61.—East Park, Hull, H. C. D.; Pearson Park, Hull, H. Knight; Hull Bank Hall and Bishop Burton, T. S.

V.C. 62.—Scarborough and Scalby, R. A. T.; near and in Middlesbrough, 'common,' J. W. H.

V.C. 63.—Bradford, F.; Moorhead (Shipley), W. P. W.; Slaithwaite, Marsh, Beaumont Park and Fenay Bridge, Huddersfield.

V.C. 64.—Gledhow and Roundhay Park, Leeds.

T. bimaculatum Linn.

Widely distributed, but local; on record for a dozen or more English counties from Dorset to Northumberland, Glamorgan and Carnarvon in Wales, and on the east side of Ireland; Scotland (one ♀), Culbin

Sands, Forres; abroad, Sweden, West and Central Europe, north of Italy and south of Russia; among grass and herbage, often on coast sandhills; the female carries her eggsac about with her like the *Lycosidæ*. *Adult* ♂ May and June, ♀s also later. First occurrence the author, Collingham Lane, May, 1903.

V.C. 61.—River bank, above Selby, Riccall and Skipwith Commons, both sexes, W. P. W., W. F.

V.C. 63.—Footpath between Askern and Campsall, many; Roche Abbey ruins.

V.C. 64.—Bishop Wood (Selby), one ♂, one ♀; plentiful on more than one occasion, Collingham Lane, Linton Common, Stubbing Moor and Dalton Lane.

T. pallens Bl.

A tiny spider with an extensive British and Continental range, West and Central Europe; beaten from bushes and the lower branches of trees and usually common. *Adult* ♂ May and June, ♀s also later. First occurrence—the author, Dalton Lane, May, 1903.

V.C. 61 and 64.—Widely distributed and stations many.

V.C. 62.—Gunnergate, Nunthorpe, Lonsdale, Ormesby, J. W. H.; Forge Valley, R. A. T.; Kilton Woods.

V.C. 63.—Hurst Wood (Shipley), J. A. B.; Martin Beck Wood, C. Y. N. U. Maltby, Walton Hall, Askern, Campsall, Deffer Wood (Cawthorn); Mollicar Woods and Woodsome (Huddersfield); Clough House Wood (Slaithwaite).

[*T. formosum* Clerck, given in S. G. B. I. as a Yorkshire species is an error, a confusion of localities having occurred].

Gen. *Phyllonethis* Thor., 1-2.

P. lineata Clerck.

Very common and widely distributed in the British Isles, Europe and North America; beaten from bushes, swept from grass or found amongst fallen leaves. The red-banded variety, *redimita* Koch., and the type very often occur together. *Adult* in summer and autumn. First occurrence—the author, Drop Clough, May, 1896.

V.C. 61, 62, 63, 64.—Well distributed and recorded stations very numerous.

Gen. *Crustulina* Menge., 1-2.

C. guttata Wid.

Common in the south of England, but rare in the north, the only other northern record being for the summit of Grassmoor, Cumberland, at an elevation of 2,800 ft.; absent from Ireland, widely distributed on the Continent and occurring in U. S. A. *Adult* from Spring to Autumn. First occurrence—T. Stainforth, Sandholme, August, 1908.

V.C. 61.—Bielsbeck, one ♂, 6 ♀s. Sandholme, one ♀; Houghton Woods (Market Weighton), 7 ♀s, T. S.; Skipwith Common, 2 ♀s.

Gen. *Steatoda* Sund., 1-1.

S. bipunctata Linn.

Absent from the Irish list, but widely diffused throughout Great Britain and on the Continent; usually common in barns, stables, neglected windows, angles of fences, etc. *Adult*, May and June. First occurrence—the author, Crosland Moor, June 1899.

V.C. 61.—Noted for all the subdivisions of the Riding except the Dune area, T. S., W. F.

V.C. 62.—Scarborough, R. A. T.; Ayton, in stables, J. W. H.

V.C. 63.—Bradford, G. H. O. (V.C.H.); Crosland Moor, Huddersfield, plentiful under stones in a certain part; Hope Bank, Honley; Almondbury, in cellars and stables.

V.C. 64.—Burley in Wharfedale, W. P. W.; E. Keswick, numerous.
V.C. 65.—Sedbergh, T. Sheppard.

Gen. *Enoplognatha* Pav., 1-2.

E. thoracica Hahn.

A widely dispersed spider; France and Central Europe, North Wales, Scotland and Ireland; in several English counties as far north as Northumberland—'frequent beneath stones in the hilly districts of Cumberland and Westmorland,' Glamorgan and Carnarvonshire. *Adult* spring and autumn. First occurrence—T. Stainforth, North Cave, April, 1908.

V.C. 61.—North Cave, one ♀, T. S.
V.C. 62.—Coatham Marshes, one ♀.

Gen. *Robertus* Camb., 3-5.
(*Pedanostethus* Sim.)

R. arundineti Camb.

A rare spider from two southern, three midland and three northern English counties; Paisley, Trossachs and Forres in Scotland; Mayo and Galway in Ireland; Isle of Man, 1908; abroad from Sweden, Holland, Bavaria, Hungary and Switzerland; usually in damp ground. *Adult* summer and autumn. First occurrence—the author, Drop Clough, July, 1900.

V.C. 62.—Coatham Marshes, one ♂.
V.C. 63.—Drop Clough, one ♂.
V.C. 64.—Adel Bog, one ♀; Ingleborough, one ♂, between Clapdale and the first cairn.

R. lividus Bl.

Common, and of Holarctic distribution; beneath stones, amongst vegetable débris and moss, and at the roots of herbage. *Adult* throughout the year. First occurrence—the author, Slaithwaite, April, 1897.

V.C. 61.—South Cave, Sunk Island, Bridlington, Houghton Woods, Spurn, Saltend, Riplingham, Holme-on-Spalding Moor, Brantingham, T. S.; Sutton Drain, E. A. P.; Dunswell, E. A. P., T. S.; Kelsey Hill, E. B.
V.C. 62, 63, 64.—Plentifully and generally distributed.
V.C. 65.—Upper Teesdale, Y. N. U.

R. neglectus Camb.

A rare spider; Dorset, Essex, Staffs., Cumberland, Westmorland and Northumberland; Fermanagh, Ireland, one ♂; Paisley, Fife and Midlothian in Scotland; abroad, Norway, Holland, France, Switzerland, North Italy, Croatia, Hungary; at roots of grass and among moss. *Adult* ♂s May to November. First occurrence—the author, Slaithwaite, August, 1903.

V.C. 61.—Birkhill Wood (Cottingham) two ♂s (*Proc. Dorset Field Club*, 1908), Skidby Chalk Pits, one ♂, T. S.
V.C. 63.—Black Hills, Bingley, one ♂, Cottingley Wood, one ♂, W. P. W.; Bottoms Wood, Slaithwaite, one ♂; Drop Clough, one ♂, one ♀; Barrett Clough, Wilberlee, one ♂.
V.C. 64.—Grassington, one ♂, Howden Ghyll (Keighley), one ♂, W. P. W.; Bardon Tower (Bolton Woods), by the roadside, one ♂; Rigton, near Keswick, one ♂; Stubbing Moor, one ♂.

(*To be continued*).

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Dr. J. W. Evans writes on 'The relation between different laws of twinning that result in the same twin-crystal,' and Dr. H. Hilton writes 'On Cleavage-angle in a random section of a crystal' in *The Mineralogical Magazine* for August.

COMMON WILD BIRDS OF THE SCARBOROUGH DISTRICT.

W. GYNGELL.

(Continued from page 328).

The Dipper (*Cinclus aquaticus* Bechstein). Resident on the moorland streams, descending the Derwent to Ayton and other becks almost down to the sea I have not found this bird so common here as on the borders of Somerset and Devon, where I have noted as many as half-a-dozen birds on a half-mile reach of the river Tone. The Dipper may be heard singing at almost any time of the year, summer or winter. Its nest, found in earthy as well as rocky banks of streams and under bridges and waterfalls, is made entirely of moss with a little dead grass and leaves. I have seen well-fledged young about by April 28th. The usual clutch of five eggs weighs one ounce. The following notes were written at the time the observations were made :—'One swimming and diving in Scalby Beck on January 6th, it remained under water from three to four seconds at each dive, after remaining for a minute or two in one spot it flitted up stream and performed again at another pool. The dip or curtseying action of this bird is repeated with clock-work like regularity about every two seconds. The song is low, sweet and varied, not unlike, but more continous than the robin's, or reminding one of the lark's song heard at a distance. In the breeding season I have seen one bird chase another up and down stream singing all the time.

The Long-Tailed Titmouse (*Acredula caudata* L.). This is by far the scarcest of the five 'tom tits' found in our district and rarely seen at all except in winter when flocking with other Paridæ in the woods. I have only come across two nests here in twenty-nine years. One of these, built only three feet above ground in a thorn hedge, was robbed by a mouse or vole that had bored through the bottom of the nest. The well-known nest is made of moss, ornamented with—or disguised by—lichens and spider-webs or wool and lined with feathers. Eight feet above ground is the highest position I have found occupied in hedge, bush or against the main stem of a tree. Ten eggs are usually laid and it would take three such 'sittings' to weigh 1 ounce. I have found eleven eggs in a nest.

*The Great Titmouse (*Parus major* L.). This, the noisiest as well as the largest member of the family, common here at all times, is sometimes abundant when local numbers are swelled by winter visitors. At such times I have sometimes seen scores together about one village. It may be heard singing '*teacher, teacher, teacher,*' as one of my scholastic friends will have it, from February 1st till November 18th and from 2-57 a.m. till 8-20 p.m. at midsummer. Its nest here is usually in a hole in a tree, sometimes in a wall, from 3 ft. to 5 feet only above ground. Moss of several species felted together with wool and hair and rabbits' fur are the materials used. From eight to ten eggs are laid, each weighing ·06 oz. The following notes are copied direct from the page in my bird book that deals with this species :—'One singing on the roof of a house. The song sometimes runs to as many as eighteen double notes. Have heard a singing bird slowly raise the pitch of its voice about half a tone. The song, I think, more resembles the sound made by sawing with a large hand-saw than the harsh noise made by a 'saw-sharpener,' a common local name for the bird.' Four or five other notes I have refer to its song. Saw one fly after another both singing on the wing. Have heard and seen a small party of Great Tits hammering at the trunk of aYew tree and making as much noise with their beaks as woodpeckers. *December 25th,* '03.—Several feeding in young grass of a stubble-field ; *January 15th.*—Great Tits feeding in grass.

When sitting in its nest hole both blue and great Titmice in resenting the calls of unwelcome visitors hiss and peck quite alarmingly. Whilst 'bird-nesting' with a friend in one of our local woods, my companion inspected a hollow tree stump some four to five feet high, six to eight inches thick and open to the sky at top. Putting his face to the opening and trying to peep in, my friend very suddenly withdrew, and called to me saying: 'I've *got* something *here.*' When I myself attempted to investigate the something I was met by a noise *more or less* like the 'powf' of a railway engine. Sitting in the bottom of the hole was a Great Titmouse and each time it gave a hiss, or rather a bark, the trumpet-shaped hollow stump, acting like a gramaphone horn, greatly intensified the sound. After we had inspected for some minutes, not knowing what was within, the bird flew out and we knew the author of what really was, until its cause was apparent, a rather terrifying sound.

The Coal Titmouse (*Parus ater* L.). Fairly common all the year round in wooded districts, coming into the town parks on occasion, where its weak imitation of the Great Tit's song may be heard as early as January 21st. It usually sings in the tops of tall trees. Its nest is often placed in holes in or very near the ground, and I once found nine young ones in a mouse's hole in a sandy bank. Occasionally I have seen it in parties feeding amongst furze bushes out on the open moors and a long way from woods.

The Marsh Titmouse (*Parus palustris* L.). More often seen here than the last named and more commonly found nesting in tree holes from seven to fifteen feet above ground. A little hair or rabbit fur clinging to the outside of the nest hole often betrays the position. In my bird note-book I have made more than one attempt to reduce this bird's notes to human sounds in phonetic spelling. I do not introduce them here as they are of little use unless vocalized. The notes are very sharp and more varied than those of the Coal Tit. On more than one occasion I have seen the Marsh Tit picking grain from freshly-dropped horse-dung on a country road. On one particular occasion the bird flew from a spruce tree down to the horse-dung, picked out a grain and carried it back to the tree, after picking at it there the bird returned again and again to the road, repeating the action several times whilst I stood within four yards. The six eggs laid by this bird weigh each ·04 oz.

*The Blue Titmouse (*Parus coeruleus* L.). Locally known as bluey, blue-cap and billy biter here as elsewhere in England, this is by far the commonest member of its genus. Its cheery call note may be heard almost all the year round, not only in woods and gardens but in our town streets. One often meets it in quite unlikely places, sometimes feeding in the crevices of our sea cliffs or far out on the open moors. I have seen it feeding on the berries of the service tree. It would indeed be an utterly wretched spot where the Blue Tit could not find a bite. Holes in walls, posts, trees, anything or anywhere will serve for the nest of felted wool, hair and feathers which is usually from three to ten feet above ground. An egg weighs ·043 oz. and I have found as many as eight in a nest.

*The Common Wren (*Troglodytes parvulus* Koch). Much less common and less noticeable than the Blue Titmouse this bird is more often called Tom-tit than Wren. Haunting hedge-rows, low bushes and close cover generally, it sometimes takes higher flights or climbs. I have thus seen it whilst foraging work its way up a tree and enter an old rook's nest forty feet above ground where it spent several minutes. The well-known loud and quick-time song of the Wren is not its only vocal performance. It occasionally sings quite another song, but which I have only heard on one occasion. On August 20th, '04, amongst some close bushes in R. wood, I heard a wren sing a faint low song in slower time and quite unlike its usual performance. The song seemed as faint and sharp as that of the Gold-crest but much longer continued. I have only one ornithological friend who has heard this select song. Never

before February 11th, although continued until Christmas, I have heard the ordinary song as early as 2-48 a.m. and as late as 8-21 p.m. The site chosen for nesting is very variable. I have found it in brambles and herbage, furze bushes, haystacks, walls, quarries, under bridges and once under some planks placed over an open grave in a cemetery. Fifteen feet above ground is the highest position that I have seen occupied. Greatly varied are the materials used ; dead leaves and fern, moss, feathers, twigs, wool, hay, straw, hair, dead herbage stems including thistle, rabbit-fur and skeleton leaves of the poplar. Usually six, sometimes seven, eggs are laid and April 16th is my earliest date for finding them. They average in weight ·05 oz. I have only one theory, and that little supported, to account for the so-called ' cocks ' nests which have no feather lining, and that is that they are, at least sometimes, perhaps weeks after making, finished and used matrimonially. One such nest found on February 14th contained a number of the green leaf buds of the honeysuckle, not necessarily placed there by a Wren, but possibly the work of some small mammal.

*The Tree Creeper (*Certhia familiaris* L.). A common resident bird in our best old woods, of deciduous or pine trees it sometimes visits our valley park. Such a very quiet and dull-coloured creature and so mouse-like in its movements it is scarcely ever seen by those who are unfamiliar with the ways of birds. Its nest of bark, dead leaves and feathers I have not found containing more than six eggs ; the weight of one is ·045 oz. The nest site is usually a hole or crevice in a tree stump up to seven feet above ground, often it is placed under a loose flap of bark.

(*To be continued*).

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YORKSHIRE BOTANISTS.

By the kind invitation of the Leeds Co-operative Naturalists' Club, the Botanical Section of the Yorkshire Naturalists' Union met in their convenient and comfortable room in Albion Street.

After reading letters of apologies for absence, the reports of the Botanical, Bryological and Survey Secretaries were considered and accepted, the date for the 1919 meeting was arranged for Saturday, October 11th, and place Leeds. It was decided to ask permission of the Executive to form a committee to deal with phanerogamic botany, apart from the Survey work, and the officers for this and the Survey Committee were left over to the annual meeting. Mr. W. Falconer then read a paper on the present flora of the Colne Valley, dealing with the alien plants and new introductions of various sorts. Miss Elsie D. Whitaker dealt with the distribution of Pinus in Yorkshire peat deposits. Dr. T. W. Woodhead showed specimens of Carrigeen Moss as collected and when bleached, and gave some particulars of the work being done in response to the Red Cross Society's requests.

Mr. R. Barnes brought a number of microscope slides of complete moss and hepatic plants and also portions of peristomes, etc. ; these were shown with the microscope kindly provided by the Naturalists' Club. Mr. Barnes' work has long been known to the Bryologists and this gave the botanists an opportunity of seeing what can be done by an expert at this work. Mr. C. Waterfall showed a rare Viola from Scoska Wood, Arncliffe.—C. A. Cheetham.

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We much regret to hear of the death of Lieut. Graham Johns, the second son of Mr. Cosmo Johns, F.G.S., of Sheffield. He was gazetted to the Scots Guards in December, 1916, and killed in action on September 27th. He was only 20 years of age. He occasionally accompanied his father on excursions of the Yorkshire Naturalists' Union.

FIELD NOTES.

ENTOMOLOGY.

Cicindela campestris (L.) in Derbyshire.—We read with great interest Mr. J. M. Brown's note on the occurrence of *Cicindela campestris* in Derbyshire. We noticed the insect in August of this year (1918) on a sandy, heather-clad hill-side at Cathole about three miles west of Chesterfield (N. E. Derbyshire).—E. and H. DRABBLE.

Gonepteryx rhamni at Louth.—Two Brimstone Butterflies, usually uncommon in the Louth district, were seen in the Kenwick area (2½ miles from Louth) on the 3rd September. A local problem with regard to this species is that no food plant (either *R. catharticus* or frangula) is known to occur there, and locally, we suspect that the spindle-tree (*Euonymus europacus*), which occurs abundantly in that area, may be the food plant. Can any of your readers give any confirmation of this surmise ?—J. LARDER, Louth.

Sciaphila sinuana in Yorkshire.—Last August, my son Rosse and I took one specimen of *Sciaphila sinuana* in Bingley Wood, which is a rare and local insect in Yorkshire, having only recently been added to our county list. In addition to this district it has been recorded from Doncaster.—E. P. BUTTERFIELD.

[*Sciaphila sinuana* has proved to be common in the county, now that we know how to find its larvæ freely in the flowers of *Scilla nutans*, the common bluebell. It has already been recorded from the Huddersfield district, where it is plentiful.—G.T.P.]

Plesiodema pinetellum Zett. in Northumberland.—I beat a pair of this Scotch insect from Scots Fir in a large wood bordering the Bellingham Road a mile or so north of Wark. Several species of *Psallus* were common at the same time, and *Plesiodema* might be passed over as a small example of one of these, if not beaten from its true host-plant. The only other record for England for this species is apparently from Cumberland by Mr. H. Britten (*Ent. Mo. Mag.*, 1916, p. 279). Mr. E. A. Butler kindly identified my specimens.—JAS. MURRAY, 2 Balfour Road, Carlisle.

Polyommatus phlaeas in Yorkshire.—In connexion with Mr. Butterfield's note on the distribution of *Polyommatus phlaeas*, this species was abundant in a rough field at Shelley, Huddersfield, in May last. When I first resided in the district ten years ago, I did not meet with this insect. About 1910 one or two were seen and it was never entirely absent, but always uncommon, till 1915, when circumstances transferred my observations to the other side of the Channel. Probably this has been an unusually good year for the species, which has

swarmed on all parts of Cannock Chase.—H. Douglas Smart, Major, R.A.M.C., Prisoner of War Hospital Brocton, Staffs, October 9th, 1918.

Cause of Coloration of P. phlaeas.—As Mr. Porritt states (p. 335) that *P. phlaeas* is quite common in the Huddersfield district, I should be interested to hear whether he has found it very variable in colour in the same season? When in Devon in August, 1892, I caught a dark and a light variety in the same field, within a week of each other. This suggested to me very strongly indeed that food supply of the caterpillar was *far more important* in deciding the future coloration of any individual specimen than the temperature is, which latter must fall on all specimens in one locality, equally or almost equally. I found the same variation with *Smerinthus tiliae* caught near each other and within a few days in Lee, South London, between 1895 and 1901.—Frederick D. Welch, M.R.C.S.

P. phlaeas is usually variable in the intensity of the red colour, and dark suffusion on the forewings, but I have not noticed more than the ordinary amount of variation here. But as, not wanting the species, I did not attempt to net, or closely examine, a single specimen this year, there may have been more variation than I know of. *Why* should the food supply be supposed to influence the colour of Dr. Welch's two specimens when they were caught in the same field within a week of each other?—G.T.P.

Cumberland Psyllidae.—The following list of Psyllidæ contains all the species I have met with in this county during the past three years. Examples of each have been named or verified by Mr. E. A. Butler, B.Sc. *Rhinocola ericæ* Curt., not uncommon at Orton in July. *Aphalara nebulosa* Zett., Orton, swept in July. *A. calthæ* Linn., Orton and Stainton. *A. exilis* W. & M., Orton, in September, Ainstable, in May. *Psyllopsis fraxinicola* Först., common, but local on Ash at Carleton. *P. fraxini* Linn., Wreay Woods, on Ash, in August. *Psylla costalis* Flor., Upperby, common on Hawthorn in October. *P. peregrina* Först., Orton, Armathwaite, common in summer on Hawthorn. *P. alni* Linn., common on Alders along the rivers Eden, Caldew and Petteril. The spring form is green, but many dark brown or red forms occur in the autumn brood. *P. försteri* Flor., Orton, Dalston, and Wreay, on Alders, frequently with *P. alni*, from July to September. *P. hartigii* Flor., Orton, on Hawthorn, in July. *P. nigrita* Zett., common on Fir trees at Orton, etc. *P. spartii* Guer., on Broom, in July, near Seascale. *Arytæna genistæ* Latr., on Broom; common at Orton, Upperby, etc., in spring and autumn. *Trioza alboventris* Först., local on Willows by the river Eden in late autumn. *T. urticæ* Linn., very common on nettles in the Carlisle district.—Jas. Murray, 2 Balfour Road, Carlisle.

Vibration or Scent in Animals.—There is a passage in Mr. Morley's remarks, p. 292, 'Experience teaches . . . scent theory of attraction must be banished,' which requires comment, if by the word 'animals' he includes mammals. Those with a well-marked scent or stink (Skunks, etc.) have glands; but, on the other hand, it seems to me clear, after observing wild mammals in confinement for over twenty years, that a male (in a species where no stink-glands exist) can recognise that a female is near, especially if the latter is 'on heat.' It seems to me there must be some scent from the female, which makes a male know it is there, even though unable to see it through the division between the cages. Many of the lower mammals can detect a smell which human beings cannot; and it seems erroneous to assume that, because no scent gland is found in a moth, there is, therefore, no smell which the male of the same species can recognise. A human being cannot tell how much or how little any particular species of moth is capable of smelling; and experience of wild mammals shows that some species can wind an enemy better than others. But are not the question of moths being attracted to light and the question of male and female moths copulating two different subjects? As to the former, when in Hertfordshire, in 1893 and 1894, the only Hawk moth which I saw come to light was an Elephant Hawk, and it dashed frequently in one direction and then in another, past the light in a way which suggested it was fascinated and attracted by the light. On the other hand, no Poplar Hawk came, although several were caught on trees within seventy yards of where the Elephant Hawk came to light. When collecting, the same summers, in Devon, I used often to pill-box netted specimens, and in order to avoid shaking them, placed the full pill-boxes on the ground in parts where I could easily find them on returning. Having spoilt some specimens when transferring them from pill-box to the cyanide killing-bottle, I made holes through the lids and the cardboard bottoms of the pill-boxes, so as to let the cyanide fumes through into the pill-box without disturbing the moths. These boxes, when filled from the net, were turned glass-top down on the ground when left, as above described, in order not to excite the moths inside by their being able to see out. On returning later, I found on several occasions another moth on the pill-box, evidently attracted by the one inside. How could the outside moth tell, *except by scenting* the one inside? During these two summers in Devon, I chased at least fifty male Oak Eggars by day, they flying in sunshine (and rapidly too at times, as I soon found out!). I never saw a female fly by day, but only by night, when the males were, so far as I could see, not active in flight! How is this explained, by wing vibration?—F. D. Welch.

BIRDS.

Early Reference to Starlings.—In this week's *Nation* is the following early reference to the starling, extracted from 'Jack of Newbury,' by T. Delaney, 1528 :—'Husbands (quoth she) think that women are like *Starlings*, that will burst their gall before they will yield to the Fowler; or like fish Scolopendra that cannot be toucht without danger? . . . I tell you, husband, the noble nature of woman is such that for their loving friends they will not stick (like the Pellican) to pierce their own hearts to doe them good.'—J. T. Sewell, Whitby, 25th October, 1918.

White Wagtail in Nidderdale.—On the 21st September last as one of my sons and I were walking from Hampsthwaite to Darley in Nidderdale, we had a fine view of a White Wagtail just as we were nearing our destination. At the place where we saw it, which was about half a mile from Darley, we had to take shelter from rain, which detained us at least half an hour, during which time it was feeding in company with a somewhat scattered party of Pied Wagtails, and at times, when it got too close, was evidently regarded as an interloper. The White Wagtail at all seasons is a rare species with us, but especially is this the case in autumn.—E. P. Butterfield.

Corncrake calling in the air.—About the middle of August, whilst I was staying on the moorside beyond Ilkley, the shrill call of a corncrake up in the air attracted my attention about 10 p.m. The position, as well as my sense of direction could guide me, was over an adjacent hayfield, then uncut. As near as I could judge the bird would be about 25 to 30 feet high. The crake was only momentary and the bird seemed to come down quickly. It was a dark night, and I had not before heard the bird so high up the moorside (just under the lea of the first moorland ledge—level with the Swastika stone), nor have I heard the bird since.—A. P. Horrox, The University, Leeds, 3rd September, 1918.

A Late Swift.—On September 29th, while on duty with a detachment of the Volunteer Regiment on the Rifle Range at Birk Crag, my attention was drawn to a Swift circling about, high above us. It was a dull day, but an exceptional one for the month, being the only one we have had without rain. As the Swifts left us on August 12th (a large number had departed previously) one wondered why this bird had delayed. I was again on duty on the range on the following Sunday, October 6th, a fine sunny day, with a strong west wind blowing, and a single Swift was again seen flying about high above us. Can it have been the same bird, and what can have caused it to linger so long after the usual time for departing? It is much the latest record I have for the district. The week

between the two Sundays had been very inclement, indeed. during the whole of September the weather has been vile and not at all the kind to tempt a bird like the Swift to linger in this country.—R. FORTUNE.

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CRUSTACEA.

Chirocephalus diaphanus from Yorkshire.—Notices of the distribution of inland Crustacea, other than Woodlice, are for some reason difficult to obtain ; perhaps few naturalists are interested in the group. Hence any records of the less well-known species are of interest. The Phyllopoda include, according to Weldon (Cambridge Natural History. vol. IV.) only three British species. Of these, *Apus cancriformis* Schaeffer, and *Artemia salina* Linn, have almost disappeared from the British fauna, the latter occurring only in brine pools. *Chirocephalus diaphanus* Prévost, appears occasionally in small muddy pools which are liable to dry up during the summer. I have found no mention of its occurrence in Yorkshire, but am able to record it from Wadsley Bridge, near Sheffield, having had, this year, specimens from a small pond in that neighbourhood. The species is probably distributed in the form of ova in the dried mud of the pond.—J. M. BROWN, Sheffield.

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MAMMALS.

Changes in the Colour of the Pine Marten.—With reference to Dr. F. D. Welch's letter (p. 303), observations on my pet Marten show that all the different shades and colours are due to the fading of the coat. It is extraordinary how the fur fades, and how different the animal looks at different times of the year. The moult takes place from May onwards. and there is a considerable addition of fur in October. The throat is only really yellow after the spring moult and when the new winter coat is coming in the autumn. This yellow tint is most fugitive and is gone in a week or two. All the fur fades, and many museum specimens are so bleached as to be unrecognisable. The skin mentioned as being a 'dirty whitish' sounds merely faded ; at any rate I have seen fur fade on the living animal from a deep chocolate brown to a yellowish drab, and on old specimens set up and exposed to the light become quite white.—(Miss) FRANCES PITT.

——: o :——

Prof. A. Meek writes to *Nature* of September 19th, describing the shower of Sand-eels near Sunderland recently referred to in this Journal. He identifies the species as the lesser sand-eel, *Ammodytes tobianus*.

CORRESPONDENCE.

SCENT GLANDS IN LEPIDOPTERA.

Mr. Taylor's article in *The Naturalist* for October is exceedingly interesting in a number of ways, the most important being that proof is given that scent glands do exist in lepidoptera. It is welcome also because it gives an opportunity of trying to clear the issue if possible, and also because Mr. Taylor definitely claims conclusive proof that scent is a sexual necessity.

Fully realizing the life-long experiences and keen powers of observation of both my antagonists, I still contend that Mr. Taylor's 'probabilities' and Mr. Porritt's 'practical certainties' are not conclusive, for the issue cannot be in anything short of the positive.

I have not read Dr. Dixey's discoveries for certain reasons, and the same reasons confine my principle observations to a restricted area in the South West Riding, therefore it is hoped the following will not be regarded as pedantic. The importance of the antennæ cannot be doubted, for it almost invariably happens that their preservation is perfect when otherwise the insect is a perfect wreck, and one's experience is that if they be removed from the male, or if the pectinations are filled with oil, pairing will not take place.

It is obvious that apterous females are a stumbling block to the vibration theory, and they would seem to prove that the vibrations of winged females are superfluous, but superfluities seldom occur in nature.*

It would be folly to deny the existence of subtle scents below the human sense, but principles on which convictions are based should not allow anyone to attach importance to them until their presence is established. But that odours are given off by some species is not in doubt, for is there not a certain drawer which one occasionally looks into, that contains a pupa case of a goat moth which for upwards of ten years has been giving off a most objectionable 'stink' that seemingly never diminishes, but which in all likelihood belongs to intransitary things. One accepted use for these odours is protection, but when it is definitely stated that nasty ones have that use only, and that the more pleasing ones are used for sexual purposes, a distinction is drawn which I admit is outside my powers of conception; for never has one had the least suspicion but that everyone of them was for protection only.

In the case of butterflies, their development has reached a high pitch of perfection, hence their safety from bird attacks.

A little more detail would be interesting as to whether the glandular scent scales are permanently attached to the wings of butterflies, or on the other hand, are freely shed like the ordinary scales during the activities of the insects, in other words, are worn specimens scentless, for it frequently happens when one finds butterflies paired the male is in a worn condition. The cause of this is, that generally speaking in a butterfly emergence, the males come out four or five days before the females, and it would appear that they have a scent protection. It is perfectly immaterial whether the odours are pleasing or abominable to the human sense, providing they are effective for the butterflies.

The odours given off by the garden tiger moth can be made to vary. When the insect is disturbed it assumes a rigid posture and from two pores behind the head exudes a yellow coloured fluid. If the larva was fed on dock the odour is not unpleasant and suggests the smell of drying oil paint; but if the larva was fed on elder the odour has a most unpleasant and powerful elder smell; both sexes being similarly affected. When a virgin female is calling, that is, vibrating her wings, she does not polute the air with her concentrated elder 'gas' so far as one has noticed. Is the musk scent of the convolvulus hawk moth given off by both sexes?

* Several papers on the causes of, and necessity for, apterous females, appeared in the volumes of the *Ent. Mo. Mag.* for 1912 and 1913.—G.T.P.

And also is it seriously contended that the separate sweet scents of the three species of common white butterflies (in all cases possessed by the males only) are used for female attraction ? If it is, my observations on these species during the past summer have been singularly at fault, for it was concluded that the exact opposite was the case.

Whatever is the cause of sexual attraction in lepidoptera it is something very complex and at the same time completely under the control of the possessor. The summer brood of *Vanessa urticæ* pair on, or directly after emergence, but the autumn brood, although the sexes fly freely together during autumn, don't pair until the following spring.*

This is a common habit also with many species of Autumn moths, of which *Cerastis vaccinii* is a striking example. The species abound in the large woods of the West Riding from early October until the following April, and it is only in the later month when the moths are worn and shabby that the desire to procreate becomes manifest.

B. Morley, Skelmanthorpe.

———o———

Mr. J. W. Taylor in his able paper on this subject makes one or two points which seem to need further discussion. In the first place he gives to male butterflies scent-producing plume-scales and, secondly, he states that it is the male which supplies the attractive force. The presence of these scales and their specific character are of course undoubted, but to my mind their establishment as secreting structures needs much faith. It is difficult to see how any cell can take on a secreting function at all unless it contains living protoplasm, or how it can carry on that function for any length of time unless supplied with ' raw material ' through the circulation. Are the scales of an insect living cells and do they receive nutriment from the body-fluids ? I think not.

That female insects attract the males by scent is to my mind in most cases obvious, and the lack of obvious scent-glands cited by Mr. Morley is no proof or indication to the contrary. The genital system is itself a complex glandular structure which, no doubt, produces the scent secretion with the other secretions necessary for the sexual functions. It is surely in accordance with what is known of vital processes in the animal kingdom that each system should be largely self-contained. Instances of male animals being attracted by scent produced by female genital organs are too numerous and obvious to need specific mention.

I have seen nothing in the pairing of pierid butterflies to suggest that the male supplies the attractive force, by which Mr. Taylor seems to mean that scent produced by the androconia of the male attracts the female from a distance. If this be so it is easily capable of proof, but I know of no exeriments or entomological tactics based on this belief. We have all seen *P. napi* ♀ at rest on a twig or the ground. Her wings may be open or shut unless another butterfly flutters over the spot. In that case the wings are held flatly open with the costal margins sloping backwards. If the visiting insect be a male the abdomen reaches up towards him while he is still a foot or more away, the only evidence I have seen of his attractive force. The male alights and investigates the female, copulation following in some cases, but often not.

In this insect the male seeks the female, finding her, I believe, by sight only. At least I have never seen butterflies assembling to a hidden female, as many moths do. Any of the pierids will fly down to investigate a resting insect of their own sex or of different species, or a piece of white

* Is Mr. Morley sure of this ? It is usually supposed that hibernating lepidoptera pair in the autumn, after which the males largely die off. I have no recollection myself of ever seeing a hibernated butterfly or moth paired in the spring; and if Mr. Morley or any of your correspondents have done so, it will be will for them to record the fact.—G.T.P.

paper. Dr. Knaggs, in his guide, suggests the use of paper decoys for practical collecting, but I know of no one who makes use of this advice.

The scents emitted by many butterflies have often been described, but is there any evidence that they are produced for any particular purpose? May they not be excretory rather than secretory? Mr. Morley has drawn my attention to the odour of elder given off by recently emerged *Spilosoma lubricipeda*, the larvæ of which have been reared on that plant. As a comment on Mr. Porritt's footnote I should like to raise the point of whether insects are sufficiently educated to find scents inherently attractive or repulsive. Many scents are considered attractive alike by insects and humanity because they depend on a similar taste in food, just as others find favour with insects and cats or with cats and mankind.

Of the sexual odours we know little or nothing because we have no community of interest; the best known substance capable of artificially exciting sexual feelings through the refactory nerves is valerian, which has this effect on cats and, according to Frank Buckland, on the large carnivora also.

The sexual odours produced by the females throughout the animal kingdom were practically imperceptible to human senses. On the other hand many male animals secrete substances in connection with their sexual processes of which the human nerves of smell take abrupt notice. The best known of these is musk.

H. Douglas Smart, Major, R.A.M.C.,
Prisoners of War Hospital, Brocton, Staffs.

———o———

FORMER STATUS OF THE COMMON STARLING IN BRITAIN.

On reading the very interesting article on this subject by Mr. E. P. Butterfield in your October issue, I venture to give you my own experience of the starling in this district. The district I am concerned with is the south and south-west of Manchester adjoining the borders of north Cheshire. Fifty-eight years ago, the starling was a very rare bird indeed in this district; I well remember, when I was a boy, how we looked upon a starling's egg as a great acquisition to our collection of eggs, and in this immediate neighbourhood there was only one pair of birds; they built in a hole of an old oak, and there was great rivalry with another keen collector as to who should be first to annex the eggs—the tree was called the 'starling oak' for a number of years. About 1870, many villa residences were built, every house offering splendid nesting sites for the starling, and the birds (where they came from I cannot say) increased rapidly, and for the last few years we have had an enormous roost in the rhododendrons on an island in our pond. In this district, and indeed in all the districts in and around Manchester, I should say the starling to-day is our commonest bird.

Herbert Massey, Ivy Lea, Burnage, Didsbury, *October 29th*, 1918.

———o———

In *The Scottish Naturalist* for September, D'Arcy Wentworth Thompson deals with 'The Sperm-whale and the Blue-whale.'.

We learn from *Nature* that Mr. J. Reid Moir describes some Casts of the human remains from Java, Heidelberg, Piltdown, Galley Hill and Cro Magnon, in the Ipswich Museum, and states that 'So far as is known this is the only collection of its kind in Great Britain.' This would be interesting, if true; but it isn't.

The Lancashire and Cheshire Naturalist for September contains the following, among other items:—'Notes on Myriapods' (Dr. and the Rev. S. G. Brade-Birks); 'Fungus Flora of Lancashire' (H. J. Wheldon); 'Vertebrate Fauna of Cheshire and South Lancashire' (T. A. Coward); 'Report on Diptera' (H. Bury). The first, however, appears to deal largely with Kent.

REVIEWS AND BOOK NOTICES.

A Memoir of John Michell, M.A., B.D., F.R.S., by **Sir Archibald Geikie, O.M., K.C.B., etc.** Cambridge: University Press. 108 pp. In this memoir, Sir Archibald has amplified the presidential address recently given to the Yorkshire Naturalists' Union, which appeared in *The Naturalist*. Our readers will be glad to have the opportunity in the recent memoir of learning more of this grand old-time Yorkshire naturalist, John Michell.

A Flora of Epsom and its Neighbourhood, by **Rev. T. N. H. Smith Pearse.** Epsom: L. W. Andrews & Son, 107 pp. In 1899, the Headmaster of Epsom College began preparing a series of reports on the botany of the area around the school, which appeared in the Annual Reports of the Epsom College Natural History Society for the following twenty years. Those have now been brought together in the present little book and form a valuable guide to the plants in the district. There is a good map.

Guildhall Memories by Alfred George Temple, F.S.A. London: John Murray, 347 pp.: 16/- net. Mr. Temple's work at the London Guildhall is well known to all educated Londoners and to many in the provinces. Himself an artist of no mean ability, he has during his long term of service to the London Corporation, converted the Guildhall into one of our most important National Art Institutions. He has a 'wheedley' way which will appeal to the collector, and having the gift of a ready writer and a good memory, his present volume is one which can be read with great interest. In his official capacity he has met with several 'great' people, and many of his pages are occupied by quaint and other narratives in reference to them—artists, writers, travellers, politicians and the nobility, and we can quite believe that he has 'deemed it wise' to make many omissions, 'chiefly on personal grounds, in respect to living individuals.' There are several illustrations, including one of the author and others of his paintings. It is perhaps complimentary to Mr. Temple to know that the present writer's son, a schoolboy, has read the book through with keen interest, though, childlike, he considers some of Mr. Temple's paintings are 'sloppy,' whatever that may mean!

Memoir of the Reverend Octavius Pickard-Cambridge, M.A., F.R.S., by his son, **Arthur Wallace Pickard-Cambridge, M.A.,** Fellow of Balliol College. Oxford: printed for private circulation, 1918. pp. 96, 8vo. It is in the nature of circumstances that the personality of a scientific correspondent is usually hidden from us until after his death. To many who read this book, and knew the subject of this memoir only as our premier British arachnologist, it will perhaps seem strange to learn that he was throughout his life a skilled musician, wrote verses that showed a keen sense of humour, and papers on Mammalia, Birds, Reptiles and Lepidoptera. This record of his life has the advantage of having been written by one who is himself a naturalist, and hence able to appreciate adequately his father's scientific work, of which he gives a full account and includes what is an extremely useful and valuable part of the book—a complete 'List of Writings,' (which includes a number of references to *The Naturalist*), classified according to subject. His earliest note on the Arachnida appeared in *The Zoologist* for 1852, but previously in the same journal and in the same year he had published a note on a 'White Willow-wren.' His last publication was on 'Spiders,' appearing in 1914, in the 'Natural History of Bournemouth and District.' He had a great belief in the value of thorough work in definite districts and always liked to have local collections to describe, as the writer can testify. He felt that it was by getting to know everything about a particular district and its fauna that a naturalist could keep in touch with, and contribute something to, the wider biological questions which lie in the background of natural history. The volume contains eight plates, which, together with the letterpress, are excellently printed.

The Nummulosphere, Part III., The Ocean Floor or Benthoplankton, by R. Kirkpatrick. London: Lumley & Co., 1 Exhibition Road, S.W. 7; price 10/- net; 328 pp., demy 8vo., 27 plates and 44 text illustrations. Our hopes of an advance in geological knowledge were raised by the statement in the introduction to this book that 'The foundations on which the stately edifice of modern geological science is supporrted are to a certain extent unsound, though easily to be made secure.' The discovery that should 'bring about a revolution in our ideas concerning the nature and origin of by far the greater part of the planetary crust, and will modify our conceptions even of cosmic evolution' is that of 'the organic origin of igneous rocks and meteorites.' We do not think that the author has attained his purpose. It appears that the sum total of his investigations is that he considers he finds nummulites, or traces of nummulitic structure, in most rocks. He asserts that the ubiquitous nummulites, or their remains, are to be seen in chalk, flint, basalt, syenite, porphyritic rocks, in *Loftusia*, *Parkeria*, *Cyalocrinus* and the Stromatoporoids. Moreover, most of the materials used in the arts had a nummulitic origin; and we are surprised at the extent to which nummulitic structure persists. Among the materials that have this structure are the terra-cotta, bricks, and slates of the Natural History Museum in London, jade, soapstone images, crockery, meerschaum, rust from an old saucepan, and the pigment in old oil-paintings. The author sees nummulitic structure in meteorites, also, though he confesses (we believe with true scientific spirit) only with difficulty. The true nature of *Eozoon* is once again declared, though we thought its *requiescat* had been finally pronounced. The many photographic plates included in this book, are accompanied by diagrammatic explanations which represent the Author's interpretation of the microscopic structures. From an inspection of these plates and of the accompanying diagrams we can only conclude that the author sees structures in rocks which other observers would probably fail to discern. Even granting that the interpretation of sections under the miscroscope may be a matter of personal opinion, we find in the text of this work examples of invalid reasoning to which we must call attention. For example, the author saw in one of Carpenter's sections of Eozoon 'something which [he] took to be a small coiled nummulite shell situated in one of the supposed chambers of the Eozoon.' He therefore 'concluded that Dr. Carpenter was right in his theory of organic origin' (p. 8). This seems to be a clear case of the fallacy of arguing from a special case to a general rule. In justice to the author we hasten to add that he enlarges on this statement (p. 77) and refers to his further research on other material. But we hold that anyone who attempts to relay the foundations of a science should not present in his Introduction such a statement as this. Then again (p. 9) we read, in a paragraph on Stromatoporoids and Receptaculites (which the author found to be formed of Nummulites), that 'These fossils are palæontologically similar to igneous rocks, and hence I regarded the latter as masses of nummulite colonies resembling coral-reefs.' We hold that an important conclusion like this should at least be drawn fron connected premisses expressed in terms of precise connotation. Again, on page 15, the author briefly replies to certain criticisms and objections:—(1) 'That no traces of organic remains could survive in rocks that had once been molten.' As regards his reply to this point we would urge that the experiment of heating a piece of Radiolarian earth is an electric furnace to 1700 deg. C. (which the author had carried out) does not exactly reproduce natural conditions. (2) 'That the supposed organic remains in igneous rocks may be of accidental origin.' The author's reply to this is that 'If a plug of granite one hundred metres long and, say, one centimetre in area, were cut out of the De Lank granite quarry . . . . . I am justified in stating that traces of organic remains would certainly be found in every section.' We do not think this is a valid argument, and, at the best, it is again arguing from a special case

to prove a general rule. The author's third point is personal, and therefore we shall not touch upon it here. To turn again to the introductory statement, we must observe that however insecure may be the foundation on which the stately edifice of geological science is supported, they were at least laid on sounder premisses and more justified conclusions than some set forth in this book. We feel, too, that the author could have done better. He is undoubtedly an accomplished microscopist, and we must be prepared to make concessions when he assures us that a specially trained eye is necessary. He has, moreover, spared neither trouble nor expense in pursuing this research. He has travelled widely in order to study rocks in their natural exposures; he has consulted a wide range of literature; and has evidently had a free hand in examining the rocks and fossils on the great National Collection at South Kensington. It must be noted, also, that he is wise enough to anticipate one difficulty, and to include a phylogenetic note, stating that 'it seems singular that nummulites, regarded as the highest type of Foraminifera, should prevail in the oldest known rocks.' We conclude that the author's views on nummulites do not agree with those of most people, and we hope that the Trustees of the Natural History Museum will adhere to their orthodoxy, and not yet cause their terra-cotta walls to be labelled as 'exhibiting traces of Nummulites.'

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NORTHERN NEWS, etc.

Frances Pitt writes on 'Seasonal Changes in the Coloration of the Pine Marten,' in the *Scottish Naturalist* for September.

We regret to learn that Mr. W. R. Ogilvie-Grant, head of the Bird Room, British Museum (Natural History), has retired on account of ill health.

Dr. W. G. Smith favours us with a copy of his paper on 'The Improvement of Hill Pasture,' reprinted from *The Scottish Journal of Agriculture*, Vol. I., No. 3.

The Manchester Microscopical Society's Annual Report for 1917 is cut down somewhat in view of the prevailing conditions, but it is nevertheless a valuable record of another year of this Society's useful work.

Among the Contents of the *Hull Literary Club Magazine*, Vol. V., Pt. II., we notice: 'Reality in Life, Education and Art,' by C. S. Hill; 'The Coming Generation,' by C. H. Gore; 'The Man, the Nation and the State,' by A. Jordan, and 'Our German Ancestors' (with map), by T. Sheppard, M.Sc.

We learn from the *Yorkshire Post* that the Leeds Philosophical and Literary Society recently entertained at tea 100 soldiers from the local hospitals, Mrs. Kitson Clark being the hostess. The lecture was by Dr. Wager, F.R.S., the subject being "Toadstools and their Ways," which black-board illustrations.

The 'Quarterly' Journal of the Geological Society, No. 290, contains a paper on *Aclisinia* and *Aclisoides*, by Mrs. Longstaff, in which she describes species from the Carboniferous Limestone of the Northern Counties; Mr. L. M. Parsons writes on the Carboniferous Limestone bordering the Leicestershire Coalfield, and Messrs. F. Dixon and T. F. Sibly writes on the Carboniferous Limestone of the South-eastern Margin of the South Wales Coalfield.

The Proceedings of the Liverpool Naturalists' Field Club for 1917, recently issued, contain the President's address, 'Notes on the Collecting of Butterflies and Moths,' by J. W. Griffin; detailed Reports of the Field Meetings during 1917; a list of the records in various branches of Natural History during the year, and an account of the Ellis Memorial, consisting of a cabinet of Coleoptera and a local Herbarium, presented by the Society to the the Liverpool Museum.

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Printed at BROWNS' SAVILE PRESS, 40, George Street, Hull, and published by A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London.
November 1st, 1918.

DEC. 1918. No. 743
(No. 517 of current series.)

THE NATURALIST

A MONTHLY ILLUSTRATED JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND.

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Smithsonian Institution
JUN 24 1920
National Museum

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NOTES AND COMMENTS.

NATURE STUDY *v.* 'GETTING.'

Mr. S. L. Mosley, writing in one of the London papers, says: 'I often take parties out for nature study, but the main object is usually to make a bouquet. If we come across a fern bank, out come the pocket knives or some other implements for the purpose of uprooting, and I have to interfere. The most beautiful places I purposely avoid for I know they would be visited again and devastated . . . . What is the reason?' Is it not our "education" system which is on an entirely wrong basis? . . . . The whole of our teaching is based on getting money. A child is brought up to believe that the principal thing in life is to get. Rot!' If all Mr. Mosley tells us is true, there is certainly something wrong—but is it not the fault of those who teach?

A LEEDS WAR MEMORIAL.

We learn from the *Yorkshire Post* that at the meeting of the Leeds City Council on November 9th, Alderman Wilson asked the Lord Mayor to call the Council together at an early date. 'A great movement was afoot in London to raise money for a national memorial, and, while appreciating this effort, he thought Leeds ought not to overlook the honour due to its men, and to the need for an adequate local memorial. Matters were already developing rapidly. Some time ago an offer was made by the Philosophical and Literary Society to sell their premises in Park Row and hand over the proceeds to the Corporation, together with the whole of the contents of the Museum. The site alone was valued at £50,000, and some of the things in the collection were priceless. The only stipulation was that any new scheme should provide a hall for the Society itself, in which to hold its meetings. It would be necessary for the Corporation to provide a site, and it was so much to the good that a suitable open space was already available, worth at least £100,000. Thus, with the gift of the Philosophical Society (£150,000) the scheme would start with a quarter of a million to the good. The Government would hand over to the city a huge collection of war trophies, which ought to be properly housed in a 'temple of fame'; and it was quite time the city was provided with an adequate Art Gallery and Central Library. This thing, he said, must be done on a large scale.' The scheme is excellent and if carried out will do much towards placing Leeds in a worthy position with regard to its Museum and Art Galleries. We trust our good friends in Leeds will follow the example of the National Museum of Wales and obtain an experienced Director *before* the scheme develops. Too often has the mistake been made of leaving a museum building entirely to the architect instead of allowing the director and architect to work together.

GLACIAL DEPOSITS.

In the *Memoirs and Proceedings of the Manchester Literary and Philosophical Society*, Vol. 62, part 3, Mr. J. Wilfred Jackson has a paper on 'The Association of Facetted Pebbles with Glacial Deposits,' in which he concludes 'In this paper facetted and wind-worn pebbles are described from three localities near Manchester, and from three others in the Wirral peninsula; in one case below the Lower Forest-bed of Cheshire. The mode of occurrence shows the pebbles to be post-Glacial and pre-Neolithic in age. They have been acted on by sand-blast at some time after the deposition of the Glacial beds on which they lay, and in this respect they agree with similar pebbles found in North Germany and in North America. A large number of pebbles have been split or fractured before being acted upon by the blowing sand, and it is suggested that the splitting is due to frost action. It is suggested that an intimate connection exists between the period of wind-erosion and the laying down of the Shirdley Hill Sand by aeolian action in early post-Glacial times. This sand usually rests on the Boulder-clay and is sometimes separated from it by a gravel bed. The latter and the several deposits of facetted pebbles appear to occupy a somewhat analogous position with regard to the Drift to that of the basement bed, or 'Steinsohle,' of the Loess of the North German Plain, where facetted pebbles are of frequent occurrence. The presence of the pebbles below the Lower Forest-bed of Cheshire is of importance, as it pushes the period of wind erosion well back in post-Glacial times, as the forest is prior to the estuarine deposits of the 25-foot submergence, and the latter are regarded as very early Neolithic. It is concluded that the facetted pebbles do not furnish conclusive evidence of a dry climate or steppe conditions obtaining in this country in post-Glacial times.'

YORKSHIRE NATURAL SCIENCE.

The following letter, signed by Mr. T. Sheppard, appeared in some of the Yorkshire papers on November 23rd :—'I notice that an inaugural meeting of the Yorkshire Natural Science Association will be held at the University, Leeds, on Saturday, Prof. W. Bateson being the President-elect. Its first object shall be "To afford opportunities for intercourse and co-operation amongst those interested in Natural Science (Chemistry, Physics, Botany, Zoology, and other Natural Sciences)." Another object is "To arrange for visits to places of scientific interest." Apparently the various officers have already been nominated. It seems to me that this Society is largely going to cover the same ground as that of the Yorkshire Naturalists' Union, which has very similar objects, and which for so many years has been doing such excellent work in the county, as

proved by the various monographs it has issued dealing with "botany, zoology, and other natural sciences"; by its monthly magazine *The Naturalist* (one of few Scientific journals which have survived the rigours of the past few years) and by the successful work at its meetings, excursions, and by the work of its different committees.'

THE LEEDS UNIVERSITY.

'The Leeds University itself has recognised the value of the Yorkshire Naturalists' Union's work by conferring honorary degrees upon some of its members, on which occasion it was distinctly stated that the University recognised and appreciated what the Union was doing. At the present time Prof. Garstang is the President, and is giving his address at the Leeds University on Dec. 7th. Among the long list of prominent scientific men who have been Presidents in previous years are a number of Professors and others intimately associated with the work of this University. From the particulars issued it seems likely that the new society is going to interfere with the work of the old, and in these times when so many of our younger men are undertaking more important duties, and those left behind are carrying on with increasing difficulties, it is unfortunate an attempt is being made to form a new Society with apparently similar objects. If it is clear that the Yorkshire Natural Science Association does not in any way encroach upon the work of the old established and vigorous Yorkshire Naturalists' Union, the matter may be different, but its objects as set out certainly make one question the wisdom of the meeting on Saturday.'

THE MUSEUM IDEA.

In *The Memoirs and Proceedings of the Manchester Literary and Philosophical Society*, Vol. LXII., part 1, Prof. W. Boyd Dawkins has an interesting paper on 'The Organisation of Museums and Art Galleries in Manchester.' In this he states, 'We owe the first idea of a Museum of Science and Art in Britain to Lord Bacon (New Atlantis) and the first realisation so far as relates to science to Elias Ashmole, who founded, in 1667, the Institution at Oxford bearing his name. This consisted mainly of natural history specimens, mingled with miscellaneous antiquities, now re-organised by Sir Arthur Evans, and transferred to new quarters close to the Taylor buildings, it has grown into the most perfect classical museum in Britain. It was not until 1747 that the British Museum, which had grown round the centre offered by the Library, was recognised by Act of Parliament. The modern Museum, arranged for scientific purposes, cannot be traced further back than the middle of the 19th century, and is the outcome of the scientific renascence associated with the names of Darwin, Huxley, Flower and

Rolleston. The old type of Museum, with its curiosities and other objects intended to excite wonder, horror or disgust, survived even in Manchester, until the beginning of the 'seventies, and still survives elsewhere in small country towns. It was this obsolete type that the House of Commons had in mind, in 1915, when they closed the British Museum, and other institutions in London for the duration of the war as being of little interest and of little or no value to the general public or to the large influx of visitors from our Colonies and America. Here, in strong contrast to this retrograde measure, both Museums and Art Galleries are not only kept open as before, but are being utilised for systematic instruction in the elementary and secondary schools. In this new development as in other fields of action, Manchester has taken the lead.'

——: o :——

White Song Thrush.—A perfectly white specimen of the Song Thrush (*T. musicus*) with the pink eyes of the true albino, is at present to be seen in a certain part of Harrogate. It is in a beautiful condition and not unduly shy.—R. FORTUNE, Harrogate, 11th November, 1918.

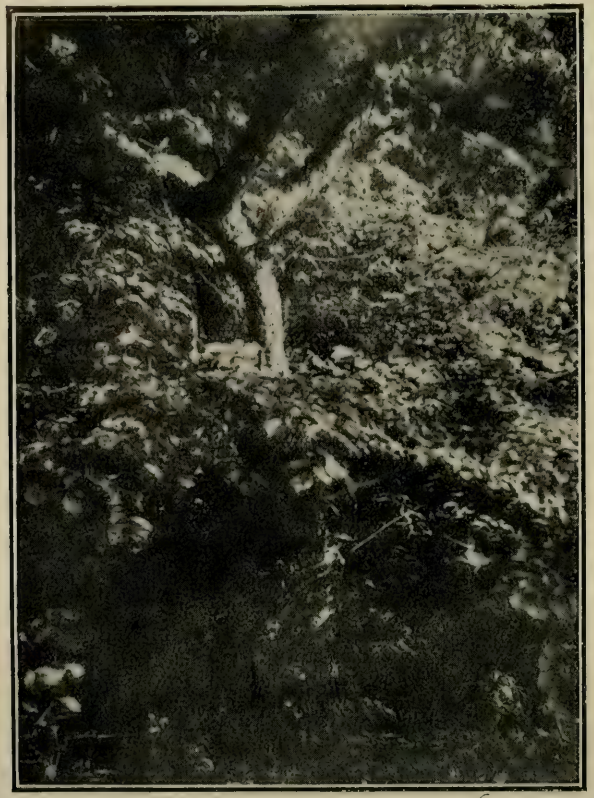
Kestrel and its prey.—On October 19th, 1918, a second case occurred, very similar to that recorded on p. 301, the pace of the Kestrel confirming the words ' considerably faster ' (line 14 of note). In this second case, the Kestrel first made a downward dash or stoop, but missed its prey ; then followed it up, and flew it down in about 25 yards. Probably the first part of the case on p. 301 was similar.—F. D. WELCH.

Late nesting of Wood Pigeon.—Whilst out shooting at Hooton Pagnall, near Doncaster, on October 26th, we put a Wood Pigeon off its nest containing two young birds about ten days old. The nest was in a young larch about six feet from the ground. A feature in bird life this year is the great preponderance of Jays which seem to have arrived from the continent in most unusual numbers.—W. A. DURNFORD.

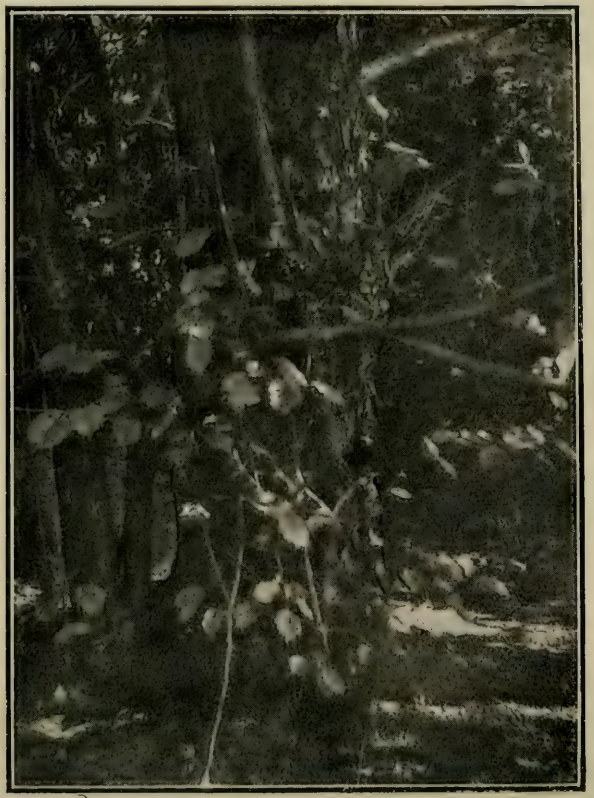
Rare Wildfowl in Upper Nidderdale.—The extensive reservoir at Gouthwaite has a wonderful attraction for migratory wildfowl, as owing to the great area of water, they can rest there in peaceful security. All the year round it is frequented by a number of Mallards and other ducks ; and during the autumn and winter many interesting wanderers find there, for a time, perfect sanctuary. During the first week of January of this year, two male Red-breasted Mergansers and a Goosander were to be seen, and at the time of writing (November 4th) a Great Northern Diver has taken up his temporary abode, having been there for more than a week.—R. FORTUNE.

The Largest Hazel in the North of England.

The Nut-Tree, 30 ft. high, with rough bark, in grounds of Meanwoodside (Kitson-Clark), 80 years old.



Umbellate branching ⅓ way up.



Planted by T. Oates about 1825-30.

THE FLORAL SANCTUARY OF A MEANWOODSIDE GARDEN.

F. ARNOLD LEES, M.R.C.S.

(With Plate VII.)

THOUGH, someday, an extension of the tram-track, to form a ring route from Leeds, *via* Headingley or Meanwood to the North 'Town-end' again, would seem to be inevitable; it is to be hoped that a 'parking' of the western area of the Meanwoodside demesne of the Oateses—one of whom succumbed so heroically in the blizzards of the South Pole !—will not be one of those things left undone for which the City Fathers might have to do penance for the loss of that beauty which is not only a 'joy for ever' but has a distinct even sanate value in Public Economics. This flor-historic enclosure has been and perhaps still is in danger of falling into the hand of the tame exploiter of the fair and feral ! Were that to eventuate, like the old Cardigan Estate 'Zoo,' wherein, though the castellated Bear Pit tower still remains, overgrown and hidden by monstrous Jews'--ears' bearing bourtrees, the writer remembers the American Agave or Aloe, traditionally flowering 'once in a hundred years,' towering into blossom and shewn for a fee, about the last 'Fifty of Eighteen-hundred, and where the stately Tulip Tree flowered too; much of unreplacable educative interest would pass for ever at the bidding of that modern Antæus the Builder who each time he 'touches earth' gains strength to go one better still.

So much and enough, for *verbum sap* has yet its growing power in the leader of the civic human tree, by way of preamble to a 'check' *deasil*—clockwise perambulation 'for luck'—of matchless Meanwoodside by certain Leeds naturalists on a not as yet very remote Thor's-day.

The party, fit, if few, as Nature's lovers ever are, were met and welcomed by the then occupying tenant (Lt.-Col. Kitson-Clark) who furnished a spectacular adit of more than mere pass-the-time value by his realistic exposition of the power of the Axe of the Bronze Age in the hairy hand of Man of early times. Mr. Clark had himself 'cast' a modern axe-head in facsimile of an original; and having thonged it securely in the old way, to a massy, kneed arm of oak, demonstrated how effectively, 'ravagingly like Randall's (the pugilist's) fist'—how many one wonders, passim, remember their Reynolds, whose name is only perpetuated in a Miscellany of the demos !—it might be wielded for defence, or quickset, offensive purpose ! its lovely lopping powers, rightly poised and slung, being exercised then and there on redundant branchwood and bavin ! It was an unforgettable exhibition, visualising and re-clothing a long defunct subject of Antiquarian surmise.

1918 Dec. 1.

These 'Meanwoodside' grounds are now, in parts, a jungle of wild and thoroughly acclimatised American vegetation, traversed by tracks—almost limberlostean ways, contracted or half erased by soil slip and overgrowth, forming, roughly estimated, a sinuous slype of mead and coppice for upwards of a quarter of a mile, along the slack wherein flows the Adel Beck (rising at its ultimate springs about Bramhope and Alwoodley Black-moor) walled-in, from Low Harry-gate where Mean—or Middlewood and Weet-wood begin;—the gap or gate having got its name, on the line of an ancient pack-horse," if not really a 'Roman' way, as the site of long-forgotten harries of Scots' Reivers in Norman to Stuartian days; and so easterly to the church schoolhouse of Meanwood's "Green road"; all of them ancient names. The beck in this bi- or tri- furlong of its scarcely fouled reach, with two or three made pools at the western end, make happy hunting grounds for many wildfowl, Mallard, Waterhen, and the Kingfisher—oft to be sighted on its arrowy flight, feathered in facsimile of sapphire and garnet; while the Greater Spotted Woodpecker has nested here, of recent years; and the whole preserves in large measure, a picture of what the fauna and flora of Cookridge Bramhope, Adeland its Black-hill, and Allwood its Black-moor was a century or more ago. Besides preserving the royal-fern (in great stools by the wooded rock-pools at the western extremity), the 'long purples' of Shakespear, and the blake Loosestrife (*Lysimachia vulgaris*) which used to 'grin' so jauntily (!) through the iron rails of the 'Spring-field-Place' gardens in Leeds—how these old-time names tell, knell their history!—the long-tasselled Sedge (*Carex pendula*) hangs its whips and rods of inflorescence over many a mossed bank of stream-side earth. Natives of old, all these here, albeit long syne extirpated from the black-earth links three miles higher up the stream, whence, they were brought in, forethoughtfully, probably on the advice of A. Denny, their original recorder for the Leeds District as the old Botanists' 'Guides' shew, to keep under eye something of the Near as foil to those others of the Far West and the great Lone Land, which the late Traveller Oates brought from the Sierras and slopes of the Rockies. Some of these have 'made good' and thrive as well as in their homeland; others are *in extremis* through compulsion of existence in tenebra un-natural to them; hard wood trees have grown up and a few other sciaphiles—shade lovers—are tending to take their place; so every rood of surface long left to itself, helps along that inevitable chain of Change with compensating vegetal links which Time is everywhere and ever forging.

Several noteworthy brambles and western fruit-bearing shrubs, quite 'maquis' as opposed to the more sterile or

herb supporting 'garigue' of the South European hills, survive however, and make a wild garden that looks Anglican enough to the casual peripatetic. It can do no dis-service to their lives to mention some by name. There are two—perhaps three—'blackberries": *Rubus spectabilis* of Pursh—a Prussian botanist who travelled much in North America—somewhat like a glorified logan-berry, with shining leaves in three lobes, curvy rose-purple petals, and amber-hued to salmon red fruits; *R. odoratus* L., fan leaved, broad rosy tinted contiguous petals, and a musk scented fruit, with a very similar white petalled growth which may be an alban variety and not the true *R. nutkanus*, of Mocino since that is parviflorous, which the blossoms of this are clearly not, and I have not seen it growing wild myself—it is the Salmon-berry of rocky woodland west from Ontario.

Within the precincts here also flourish the '*odoratissimus*' Hawthorn, the rare—in North English nurseries—*Æsculus Pavia*, the Red tassel-bloom Buckeye, looking like a neat horse-chestnut as to leaf but with much smaller catkined blossoms: not to be confused with the now grown-common Rose-flowered Chestnut of our shrubberies. In the tangled maquis hereabout, clamorous for a share of Light—ever the would-be perfect tree's great and constant cry, ages older than Goethe—*Amelanchier canadensis*, the Shad or Juneberry, upshoots its slender shafts, spray crowned in late May with a bridal veil of blossom, lovelier even than the wild 'Jean' or Cherry, bearing edible but hardly esculent haws, in late summer, calling up to the tongue that first austere gout of a scarlet rowan or a 'grec' Siberian crab-apple. Grec, spell it how one may, is 'good Yorkshire.' Look lower and one may also see the Box-leaved Huckleberry; and the *Rhododendron punctatum* of the Alleghanies, rose-flowered and dotted with translucent gland apertures sub-foliarly; the cut-leaved Alder, a variant (how originating I know not) of that brook-bank pyramidic not canopied hunch-back tree which in our vale lands of York has all the art value as it has the reverse silhouette of an Oak; and near this a few examples of the writhen, grey iron-arm'd Hornbeam, about a century back much planted around Leeds, but which nurserymen have discarded for quicklier growing trees, so that the surviving scarecrows one may see are long past their best; as a lad I knew five in the stripes of shelter-wood bordering Stonegate and Otley roads, and all have now decrepited, like child-workers old before their time. Two, sheltered are reliquarial here, and another and finer still burgeons characteristically below the east margin of the Upper 'lake' at Roundhay.

By the stream just above and below the culvert bridge, two other 'foreigners' claim notice—especially when in fruit.

One is the smoke-tree (*Rhus Cotinus*, or *cotinoides* Nutt. in this American form) with the sparingly developing seeds of the immensely plumose panicular pedicels (like grey feather or reek) growing gibbous after cashew-nut fashion ; and the other the Cornel ' cherry ' of the Dogwood tribe, inconspicuous enough except when in fruit, though possessing a mask all its own ; the Red English dogwood companions it here. Last, but by no means least, in the forefront of the shrubbery, riots the finest, largest and possibly oldest Hazelnut tree in the north of England. It is noteworthy not only from its bulk and loft (quite 30 feet) but for its well-developed rugged scabby and fissured forest-tree bark, hardly recognisable as one with the grey shiny scurfy rind of the wandy hazel of the holt. It deserves its picture ' taken ' by aid of the sun in latest autumn when the bulk of its rough umber leaves have planed or shuttled down to make another layer of that mould the lowliest flowers of earth so dearly love. Its tiers of leafage were too sun-shot at the time of our illustration, painstakingly kodaked by Douglas las Eaton.

For the rest, of uncommon and so far significant naturalisations in the protected purlieux of this Flora's glebe, on whose beauties amorous Sol has palinured (as Stevenson might have said) without molestation or any rival, for quite seventy-five years, considerations of space forbid a full enumeration. We turn to go, and yet more than once look back, for an almost amphiental Alpine Rose is there ! shedding its full crimson petals indifferently upon its multitude of gory thorns, upon ivory-bell'd tuberous comfrey, growing now no nearer than Nidd or Yore ; and gentian-blue Stone seed (*Lithospermum purpureo-cæruleum*—(the longest name in our flower-basket) ; whilst in another corner by the flag-fringed pool, the Indian ' Shallon ' or Leather Leaf, a wintergreen of the Klondyke, with pink-flusht waxen bell-bloom, seems to outbreathe a mute appeal, ' Sniff me—I smell of the sweet birch and the pine gulch I came from,' to our sense ; but time flies, and one must hurry away, past Canadian cinque-foil at our feet, with Poison-Oak and Traveller's Joy on either hand to that exit from this veritable jail of the Uncultivated which is, one may suppose, unique since we quite long to be immured in it again.

——: o :——

The South African Journal of Natural History, being the official organ of the South African Biological Society, with which is incorporated the Journal of the South African Ornithologists' Union,' Vol. I., No. 1, 122 pp., 6/-, is an excellent publication. It contains a history of the Biological Society, and of the South African Ornithologists' Union and the Transvaal Biological Society. There are many papers on birds, insects, and a description of a new South African Baboon. There is an illustration and description of ' The Captain Scott Memorial Medal.' The publication is well printed and well edited.

METHODS OF COLLECTING MINUTE MOLLUSCA.

H. BEESTON.

In *The Journal of Conchology*, Vol. VII. (1893), p. 208, Mr. R. Standen gives a list of shells (chiefly the minuter species) obtained by sifting the deposits from the 'pockets' of the Sand-dunes of Portsalon, Ireland. He collected 446 shells, representing 15 species, from a pint of deposit.

In *The Irish Naturalist*, Vol. XVIII. (1909), p. 115, Mr. R. Welch also gives a list of 14 species obtained from sifting dune deposits obtained at Tramore (Horn Head) N.W. Donegal.

In both these instances the shells were already collected together by wind or water action, and only required 'bagging,' sifting and sorting. They were all practically on the surface or very slightly buried.

It is quite evident that if all these species had had to be searched for *alive* in their original habitats, the quest would have been a long and tedious one, and certainly not as successful as far as the number of species is concerned, as the easy method of collecting and sifting the sand from the pockets.

This leads us to the aim of this short article.

In August, 1913, I spent a short holiday at Arnside, Westmorland, with the intention of following my conchological bent, but as the weather was extremely dry, I was somewhat disappointed with the results.

Knowing it was useless wasting time searching hedgerows, etc., I decided to try my luck in the woods, and so crossed over to Eggerslack Wood—the conchologist's paradise—Grange-over-Sands.

My special quest was the two rare species *Acicula lineata* and *Acanthinula lamellata*, both of which I knew were to be found in the wood.

Arriving there, I carefully removed the topmost layer of sun-dried beech leaves and began the search.

An hour's diligent operations on a hot August day, with little or no result, is discouraging work. Having a canvas collecting bag, it suddenly occurred to me to collect as much material as possible and try the sifting process, which has been so successful with sand-pocket debris.

I carefully filled the receptacle with the *half-decayed* leaves and leaf mould from the layers, which were covered thickly with white mycelium threads, from two or three inches below the surface.

This bag of refuse I carefully dried in the sun, rubbed it gently through my hands, and threw away the largest leaves, sticks, etc., leaving only the smaller broken particles, and the bulk of the mould.

I then sifted the residue roughly through a large mesh

dredge, taking out much more of the coarser material. A casual examination of this revealed several *A. lineata* and odd specimens of other species.

This decided me to gather a further quantity of mould, etc., which I treated in like manner, and packed this dried stuff away for minute examination at leisure.

Later, I again passed all the material through a fine sieve of miller's gauge, and reduced all the refuse to the capacity of *one pint* of fine dry dust, the same quantity of residue from which Mr. R. Standen obtained his 446 specimens. The two bags of material, before sifting, would not at the most measure more than two gallons.

I then began a thorough and systematic search with a powerful lens of large field; the result to me was somewhat astonishing, for the total number of shells discovered in the small amount of material runs into four figures, viz., 1,031, comprising 16 species.

When it is remembered that this great quantity of shells was collected from a small area of about four square feet, and as I did not go deeper than three inches after removing the loose top layer of leaves, altogether the quantity removed for sifting and examination would not be more than one cubic foot.

It seems almost incredible that such a vast quantity of mollusca could be found inhabiting such a restricted space.

A simple calculation on the above basis works out at 27,810 to the cubic yard, truly a marvellous example of the prodigious numbers of small mollusca which lie hidden just below the surface.

I do not wish to infer that shells are to be found in such great numbers everywhere in woods, not even in Eggerslack Wood, which is so rich in small species of mollusca, but that no doubt in suitable localities the minuter forms of snails may be said to fairly swarm.

It is no wonder then, that if this great prodigality of molluscan life obtains, that the fallen leaves rapidly become disintegrated and disappear, as without doubt these minute forms of life feed on decomposing vegetation, and therefore they hold an extremely important position in the economy of nature, acting as very efficient and useful scavangers.

The following table gives the number and percentage of each species found:—

Species	Number.	Percentage.
Carychium minimum	827	80·2
Acanthinula lamellata	48	4·6
Punctum pygmæum	43	4·1
**Acicula lineata*	40	3·8
Small and immature Vitreas	30	2·9

* Of this species 11 of the 40 (27·5 per cent.) were variety *alba*.

Species.	Number.	Percentage.
Euconulus fulvus	8	·7
Vitrea pura	6	·5
Jaminia cylindracea	5	·4
Pyramidula rotundata	3	·2
Cochlicopa lubrica	3	·2
Vallonia costata	3	·2
V. excentrica	1	·09
Acanthinula aculeata	1	·09
Vertigo alpestris	1	·09
V. substriata	1	·09
Sphyradium edentulum	1	·09
Total	1031	

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BOTANICAL NOTES—MAINLY FROM THE COLNE VALLEY.*

WM. FALCONER,
Slaithwaite, Huddersfield.

The increase of tillage in the Colne Valley has led to the appearance of several agrarian weeds, previously absent, most of them common, but a few more unusual, viz., *Galeopsis versicolor* Curt., patches amongst the plentiful *G. tetrahit* L., in one or two fields about Slaithwaite, *Medicago denticulata* Willd. in flower and fruit amongst oats at Holthead (800 ft.), *Lepidium sativum* L. at Polegate and *Bupleurum rotundifolium* L. in a garden at Wood Nook. Solitary examples were seen of *Linum angustifolium* Huds. by the roadside at Barrett Clough Head and *Lepidium campestre* R. Br. on waste ground at Kirkburton (Fenay Valley). These are mere casuals with no probability of establishing themselves, but *Bidens tripartita* L. and *Lycopus europaeus* L., whether due in the first instance to canal traffic or man, have in recent years spread and increased along the course of the canal between Huddersfield and Low Westwood (Golcar). *Acorus calamus* L. maintains its station at the side of Ramsden Mill dam (not, I am told, the 'Milnsbridge' of Lees' Flora), where also and at Pearson's dam and New Close (Slaithwaite) *Scutellaria galericulata* L. may still be found in plenty. A few others, once probably more or less abundant, are now almost extinct, and the localities, therefore, are not particularly defined. The sundew (*D. rotundifolia* L.) grows in two spots in the Colne Valley, in one of them certainly planted; the beech fern in the Slaithwaite area and near Meltham; the oak fern in the Golcar area. Adder's-tongue fern is found at Wilberlee and Wood Nook and remains unnoticed and undisturbed, owing in some measure to its resemblance to

* Read at the Annual Meeting of the Botanical Section, October 4th, at Leeds.

young leaves of the bistort, which covers considerable areas in the same fields. Heart's-tongue fern, once I am assured by old native naturalists so common in Merridale, Slaithwaite, has completely vanished thence, the last having been uprooted and transferred to a greenhouse some years ago, but in June I was shown a solitary specimen springing out of an old wall near a stream in the Holmfirth district, unfortunately bordering a constantly used footpath. An odd plant of *Genista anglica* L. still lingers on in a moory field at Cop Hill, Slaithwaite. Other plants now established in the valley have been intentionally introduced by local naturalists. *Hottonia palustris* L. has, however, gone from the dam near Marsden, but *Claytonia sibirica* L. abounds in damp woods by the river and canal at Slaithwaite, and *C. perfoliata* Donn. at a place near Marsden. *Hypericum elodes* L., originally brought from Surrey, flourished many years by a dam in the neighbouring Blackburn valley, but of late has suffered much from the depredations of the unappreciative passers by. *Gentiana campestris* L., thrives in a field near Shred, *Narthecium ossifragum* Huds. less plentifully in two wet places at Boothbanks and in Drop Clough, while *Pinguicula vulgaris* L., also in the latter place, is steadily diminishing as the result of rock-slides. In September of last year a so-called viviparous example of *Cynosurus cristatus* L., was met with near Wilberlee, at an elevation of 800 ft. Doubtless the long continued cold and wet had something to do with the suppression of the usual leisurely flowering and seed-ripening processes, and the substitution therefor of the more easily and quickly produced offshoots or miniature plants, which have also the added advantage of being a stage or two farther advanced in development with lessened risk of destruction. I am not aware that the phenomenon has been observed in this grass before, but if not, it is quite possible that in similar unfavourable circumstances, others not known to be viviparous may occasionally become so without being noticed, thus conceivably laying the foundation for the acquisition of the habit as markedly as in *Festuca ovina* L. The alien, *Matricaria suaveolens* Buch. now occurs in considerable quantity on waste ground at Fenay Bridge and probably also at other places on the same horse traffic route. A good assemblage of other aliens may be seen at the Slaithwaite corn mill tip in Hollin's Row, but not in such variety as usual, owing to the restricted importation of foreign grain and wool, and this has also been my experience in the Calder Valley. Apparently therefore, many of the aliens do not altogether establish themselves, but in normal times receive reinforcements year by year.

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The Entomologist's Record for October has a note on 'Racial and Sub-specific Names,' by Dr. T. A. Chapman.

ORNITHOLOGICAL OBSERVATIONS AND REFLECTIONS IN SHETLAND.

EDMUND SELOUS.

(*Continued from page 350*).

Darwin says: 'As some of the lowest organisms, in which nerves cannot be detected, are capable of perceiving light, it does not seem impossible that certain sensitive elements in their sarcode should become aggregated and developed into nerves endowed with this special sensibility.'* Let us imagine this done and these lowly organisms seeing through a respectable pair of eyes, but yet retaining this original power of visual perception, without their aid, and sometimes making use of it, not as a matter of choice, probably, but because it could not be avoided. It will be admitted, at least, that there would be no great wonder here. Yet if we suppose that no sense-organs had ever been founded upon this rudimentary perception of light, either in these or any other organisms, including our own, then the movements, or other indications from which the existence of such a power is now deduced, would, not improbably, be attributed by us to some other kind of perception with which, in developed form, we might then conceivably be acquainted. It could, no doubt, be pointed out that there did not seem to be any close relation between such movements, etc., and the special sense, possessed, in common, by ourselves and these organisms, to which we were inclined to attribute them, but, for all that, they would, for a long time, continue to be attributed to that sense, because it would be there (designated by a familiar word on which thought could concentrate) whilst eyes would not be—'*les absents ont toujours tort.*' The sole reason, however, for the development of any sense-organ, through natural selection, is its use to the species. The foundation, for all we can see, may be there, for various other such structures, which, did they exist, would enlarge, multiply and perhaps correct our outlook on the universe, in ways inconceivable to us—for who can imagine a new sense? It does not, however, follow that, between such inchoate receptivities and even the first scaffolding, so to speak, of special structural accommodation for them, there can be no intermediate stages of use and development—at least I cannot see that it does. In all cases, structural development has to await opportunity, and, long before that came, the strength, definedness and use of any organless percept might, through the laws of heredity and general evolutionary principles, have been on the increase. This is not mere matter of pos-

* 'Origin of Species,' 1888 edit., Vol. I., chap. 6, p. 224.

sibility, but actual fact. To take birds, again, if all that we now know, in connection with their migrations, is not sufficient to establish a sense or faculty of direction,* which must be of the utmost consequence to them, then, as it appears to me, the attempt to establish fact upon evidence, only,† may as well be given up; but without coming to birds, who probably lead the way here, what I have myself seen accomplished by Bushmen, to say nothing of much more that is known both in their case and that of other primitive peoples, has been more than sufficient to make me, at least in one instance, successfully resist the proud tendency not to admit what one can't comprehend, that, through life, makes such sceptics of us all. But there is no special organ, so far as we know, through which this sense of direction is exercised, though, upon it, the actual life both of birds and men must often depend.

An attempt, as previously intimated, has been made to explain the collective, ordered movements of birds—especially their evolutions in flight, which have often excited wonder—by calling them 'hereditary drill.' But words must work, to explain facts, and, first of all, should make themselves relevant to them. This is only the case with one of the two here offered. No doubt these movements are hereditary, for they are a part of all those that occur in natural history, but how, or in what sense, are they drill? What do we mean by drill? Or, rather, what does drill mean? This is a matter for the dictionary to decide, and to that decision we must needs adhere, or there will only be confusion in the camp of King Agramant. The New Dictionary, now in course of issue, gives, excluding what is here irrelevant, the following definitions, viz.:—'(4) the action or method of instructing in military evolutions; military exercise or training; an exercise of this nature. (5) One who drills (others); a drill-master. (6 fig.) Rigorous training or discipline; exact routine; strict methodical instruction.' All these, except perhaps that of 'exact routine' tell us that instruction, given and received—something taught and learned—is the essential meaning of the word. If therefore we say that the aerial evolutions and simultaneous movements of birds are due to hereditary drill, what we ought to mean is that birds have been drilled in them, as soldiers are by their officers, and now go through such drilling by instinct. If we do not mean this we are not saying anything pertinent, but if we do, then we have to account for the apparent absence of the essential feature of instruction, viz., an instructor, and,

* Or something else still more mysterious, in which this, as a result, is contained.

† My view is that only a quite limited stock of human opinion is really based upon evidence—and that of a neutral kind, by which I mean neither very attractive nor very repugnant to the holder.

also, to explain how movements that once waited upon instruction, through signal, command or example, do not, now, await anything, but arise spontaneously through a simultaneous resolve of distinct units that, owing to their numbers, and the space occupied by them, cannot, in the majority of cases, all see, or all hear each other. In short, he must explain how one kind of thing has been 'perfected' (another word-offering) without essential change, into another and totally different kind of thing. This, of course, is impossible, whilst to hold that such essential change has taken place is simply to leave the whole question open, with the addition of a gratuitious assumption, without evidence and against sense. As for the sixth definition, 'exact routine,' the sense of instruction seems also, by inference, to be implied here, but, even if otherwise, there is not much help to be got from it, since, if we turn again to our Murray, we find that 'routine' is: 'A regular course of procedure; a more or less mechanical or unvarying performance of certain acts or duties.' He, therefore, who explains to us that birds, over a wide space, and numbering thousands, rise with solidarity, or sink a babel of cries into a hush still more striking, by contrast, or tilt, in flight, their multitudinous wings so that, in one second, the whole host is brown, and, the next, a light grey, as the light of the sun falls or ceases to fall upon them, or strikes them at different angles, by exact routine, means, in so far as these words mean anything, that they do so because they do so. This, too, is no explanation.

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Common Buzzards at Cattal.—Two Common Buzzards have been frequenting the district between Goldsboro' and Cattal for the last week or two, and are there at the time of writing (November 6th). They apparently roost in the Ribstone or Goldsboro' Coverts. The inhabitants in the district imagine them to be eagles.—R. FORTUNE.

Late Stay of Swifts at Harrogate.—Referring to my note on the above in *The Naturalist* for November, p. 361, I have to record a still later date. I was again on duty on the Range on Sunday, October 13th, and to my surprise again saw a Swift flying above us, and drawing the attention of my colleague to it, he exclaimed, 'there are two of them,' which proved to be the case. They may have stayed a day or two later, but there were no signs of them on the following Sunday. These dates are of course exceptionally late ones and worthy of mention, although they do not constitute a record, for one was seen in this neighbourhood on November 16th, 1901, as recorded in 'The Birds of Yorkshire,' and one is said to have been taken in a dormant state at Bolton Hall, in mid-winter.—R. FORTUNE.

PLANT GALLS FROM THE BRIDLINGTON DISTRICT.

WM. FALCONER,
Slaithwaite, Huddersfield.

THE following plant galls were observed during the first week of September last, without any special or lengthy search being made for them :—

LEPIDOPTERON.

Tortrix palaena Herbst. Old galls noted from south of Bridlington to Danes' Dyke along the cliffs.

HYMENOPTERA.

Pontania proxima Lep. Bempton.

Aulax papaveris Perr. On coast below the town.

DIPTERA.

Perrisia acrophila Winn. Danes' Dyke—rare.

P. fraxini Kief. Danes' Dyke, plentiful.

P. crataegi Winn. Danes' Dyke and Bempton.

P. galii H. Löw. Sandhills south of Bridlington, on both stems and floral stalks, plentiful.

P. —? sp. On *Galium verum* Linn. Terminal leaves massed into an ovoid gall, some of them purple at base. *Larvae* 5-6, pale yellow in the central cavity; plentiful at the same place as the last.

P. marginem-torquens Winn. on *Salix viminalis* in a garden, Bridlington.

P. plicatrix H. Löw. Danes' Dyke, scarce.

P. urticae Perr. Common and general.

P. lathyri Kief. Bempton, on one plant.

Mikiola fagi Htg. Danes' Dyke.

Urophora solstitialis Linn. Danes' Dyke and Sewerby, plentiful.

Contarinia steinii Karsch, cliffs between Sewerby and Danes' Dyke.

Phorbia seneciella Meade, south of Bridlington, abundant.

Rhopalomyia millefolii H. Löw, as the last.

HOMOPTERA.

Psyllopsus fraxini Linn. Danes' Dyke, abundant.

Phyllaphis fagi Linn., as the last.

Aphis padi Linn., on blackthorn, Bempton.

Rhopalosiphum ribis Linn. In a garden, Bridlington.

ACARI.

Eriophyes brevitarsus Fck. Bempton.

E. nalepai Fck. Danes' Dyke, plentiful.

E. goniothorax Nal. As the last.

FUNGUS.

Protomyces pachydermus Thüm. By roadside at Bempton village.

LIST OF MARINE MOLLUSCA OF ICELAND.

HANS SCHLESCH,
Hellerup, Denmark.

(*Continued from page 346*).

II. PTEROPODA.

Limacina helicina (Phipps).
Spiralis balea Möller.
Cleodora pyramidata (Linné).
Clione limacina (Phipps).

III. SCAPHOPODA.

Dentalium entale Linné.
,, ,, var. *infundibulum* Lee.
,, *occidentale* Stimpson.
Siphonodentalium vitreum M. Sars.
* ,, *lofotense* M. Sars.

IV. BRACHIOPODA.

* *Neatria gnomon* Jeffreys.
Rhynchonella psittacea (Gmelin).
Terebratella spitzbergensis Davidson.
Terebratulina caput-serpentis Linné.
Terebratula arctica Friele.
Waldheimia cranium (Müller).

V. PELECYPODA.

Anomia patelliformis Linné.
,, *ephippium* Linné.
,, ,, var. *squamula* Linné.
,, ,, var. *cylindrica* Brown.
,, *aculeata* Linné.
Pecten aratus Gmelin.
,, *islandicus* Müller.
,, *pusio* Linné.
,, *septemradiatus* Müller.
,, *groenlandicus* Sowerby.
,, *tigrinus* Müller.
,, *striatus* Müller.
,, *imfriber* Lovén.
? ,, *undatus* Verrill & Smith.
,, *similis* Laskey.
,, *frigidus* Ad. Jensen (= *P. fragilis* Jeffreys ?).
,, *vitreus* (Chemnitz).
**Amussium lucidum* Jeffreys.
Lima subauriculata (Montagu).
,, *subovata* Jeffreys.

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Lima ingolfiana Ad. Jensen.
,, *jeffreysi* Fischer.
,, *sarsi* Lovén.
,, *excavata* Fabricius.
,, *gwyni* Sykes.
* ,, *hyperborea* Ad. Jensen.
Mytilus edulis Linné.
Crenella decussata (Montagu).
Dacrydium vitreum Torell.
Modiolaria faba Müller.
,, *discors* Linné.
,, ,, var. *laevigata* Gray.
,, ,, var. *substriata* Gray.
,, *nigra* Gray.
,, *corrugata* Stimpson.
Modiola modiolus Linné.
,, var. *ovata* Jeffreys.
,, *phaseolina* Philippi.
,, *umbilicata* Pennant.
Yoldia hyperborea Torell.
,, *limatula* Say.
**Malletia cuneata* Jeffreys.
Portlandia frigida (Torell).
,, *lucida* (Lovén).
* ,, *intermedia* (M. Sars).
,, *lenticula* (Möller).
,, *arctica* (Gray).
Leda minuta (Müller).
,, *pernula* (Müller).
Nucula delphinodonta Mighels & Adams.
* ,, *nucleus* (Linné).
,, *tenuis* (Montagu).
* *Limopsis aurita* (Brocchi).
Arca pectunculoides Scacchi.
Arca glacialis Gray.
Cardium (*Serripes*) *groenlandicum* Chemnitz.
,, ,, ,, var. *boreale* Chemnitz.
,, ,, ,, var. *oblonga* Posselt.
,, *elegantulum* Möller.
,, *ciliatum* Fabricius.
,, ,, var. *planior* Mörch.
,, *minimum* Philippi.
,, *echinatum* Linné.
,, *fasciatum* Montagu.
Cyprina islandica (Linné).
,, ,, var. *inflata* Odhner.
Astarte borealis (Chemnitz) (=*A. arctica* Gray).
,, var. *sericea* Posselt.

Naturalist,

Astarte crenata Gray.
,, ,, f. *typica*.
,, ,, var. *subaequilatera* Sowerby.
,, ,, var. *anticostata* Jeffreys.
,, ,, var. *crebricostata* McAndrew and Forbes.
,, ,, var. *inflata* Hägg.
,, *sulcata* (Da Costa).
,, *elliptica* Brown (=*A. compressa* Linné).
,, ,, var. *depressa* Posselt.
,, *banksii* (Leach) =*A. montagui* Dillwyn).
,, ,, var. *striata* Leach.
,, ,, var. *globosa* Möller.
,, ,, var. *warhami* Hancock.
Cyamium minutum Fabricius.
Mactra elliptica Brown.
,, *solida* Linné.
**Montacuta dawsoni* Jeffreys.
,, *maltzani* Verkrüzen.
Axinopsis orbiculata G. O. Sars.
**Axinus eumyarius* M. Sars.
* ,, *croulinensis* Jeffreys.
,, *flexuosus* (Montagu).
,, ,, var. *gouldi* Philippi.
* ,, *ferruginosus* (Forbes).
Venus fluctuosa Gould.
,, (*Timoclea*) *ovata* Pennant.
,, (*Chamella*) *gallina* Linné.
Dosinia spuria Gmelin.
Lucina borealis Linné.
Lasaea rubra Montagu.
Abra prismatica Montagu.
Scrobicularia nitida (Müller).
,, *prismatica* Montagu.
Tellina (*Macoma*) *balthica* L.
,, ,, ,, var. *groenlandica* Beck.
,, ,, *calcarea* Chemnitz.
**Neaera obesa* Lovén.
* ,, *subtorta* G. O. Sars.
Trachia septentrionalis Jeffreys.
,, *truncata* (Turton).
,, *villosiuscula* Jeffreys.
Teredo denticula Gray.
Cochlodesma praetenuis Montagu.
Corbulamya steenstrupi Mörch.
Lyonsia arenosa (Möller).
**Lyonsiella abyssicola* M. Sars.
Saxicava arctica (Linné).
,, *pholadis* Linné.

**Cyrtodaria siliqua* (Spengler).
Mya arenaria Linné.
,, *truncata* Linné.
,, ,, var. *uddevallensis* Forbes.

LIST OF LITERATURE.

GUDM. BARDARSSON : Mœrker efter Klima-og Niveauforandinger ved Húnaflói i Nordisland, Köbenhavn, 1910.

R. BERGH : The Danish Ingolf-Expedition, Vol. II., Part 3, Nudibranchiate Gasteropoda, Copenhagen, 1900.

G. J. JEFFREYS : British Conchology, London, 1863/69.

AD. JENSEN : Lamellibranchiata from the Danish Ingolf-Expedition, Copenhagen, 1912.

O. A. L. MÖRCH : Faunula Molluscorum Islandiae, Havniae, 1869.

NILS ODHNER : Marine Mollusca of Iceland, Stockholm, 1910.

H. J. POSSELT & AD. JENSEN : Grönlands Brachiopoder og Blöddyr, Köbenhavn, 1899.

H. J. POSSELT : Östgrönlandske Mollusker, Köbenhavn, 1895.

G. O. SARS : Mollusca Regionis arcticae Norvegiae, Kristiania, 1878.

H. A. SCHLESCH : Faunula Littorinidae Islandiae, Hull, 1916.

J. SPARRE SCHNEIDER : Tromsösundets Molluskfauna, Tromsö, 1886.

O. TORELL : Bidrag till Spitzbergens Molluskfauna, Stockholm, 1859.

T. A. VERKRÜZEN : Schabe-Ausflug nach Island im Juni und Juli, 1872, Frankfurt, a/M 1872.

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Scarcity of the Wheatear, etc., in the years 1917 and 1918.—Much has been written regarding the changes in the status of birds subsequent to the severe winter of 1916-17, but this has had reference chiefly to our resident species, as was to be expected. In this immediate neighbourhood one of our earliest migrants, the Wheatear, which was, previous to the summer of 1916, more or less common a breeding species, has been almost totally absent. Indeed, for the last two summers, I have not found a single nest near Wilsden. I found one nest in 1917 in a wall adjoining an old quarry near Shipley Glen. I have often wondered whether this scarcity was merely local or applied more generally to its breeding area.

The Song Thrush, which was hit hard by the winter of 1916-17, recovered slightly, I think, last summer, but I fear it will take many years, even if favourable years, before we may expect to see it breeding again in its normal nuumbers.—E. P. BUTTERFIELD.

WESTMORLAND COLEOPTERA.

F. H. DAY, F.E.S.

(Continued from page 288).

CLAVICORNIA.

Euplectus sanguineus Den. Melkinthorpe (Britten).
Brachygluta (*Bryaxis*) *fossulata* Reich. Melkinthorpe (Britten).
Reichenbachia (*Bryaxis*) *juncorum* Leach. Melkinthorpe (Britten).
Bythinus bulbifer Reich. Melkinthorpe (Britten).
B. validus Aub. Melkinthorpe (Britten).
B. puncticollis Den. Melkinthorpe (Britten).
Stenichus (*Scydmaenus*) *collaris* Müll. Tebay (Bowman), Melkinthorpe (Britten).
Scydmaenus (*Eumicrus*) *tarsatus* Müll. Tebay (Bowman).
Choleva agilis Ill. Tebay (Bowman), Melkinthorpe (Britten).
Nargus velox Spence. Tebay (Bowman), Melkinthorpe (Britten).
Catops fumatus Spence. Cliburn (Britten), Witherslack (Day).
C. watsoni Spence. Tebay (Bowman), Cliburn (Britten).
C. fuscus Pz. Tebay (Bowman), Melkinthorpe (Britten).
C. nigricans Spence. Tebay (Bowman), Melkinthorpe (Britten).
C. fuliginosus Er. Tebay (Bowman), Melkinthorpe (Britten).
C. chrysomeloides Pz. Tebay (Bowman), Melkinthorpe (Britten).
C. tristis Pz. Tebay (Bowman), Witherslack (Day).
C. coracinus Kell. Melkinthorpe (Britten).
C. kirbyi Spence. Melkinthorpe (Britten).
Ptomaphagus subvillosus Goeze. (*sericeus* Pz.). Tebay (Bowman), Melkinthorpe (Britten).
Colon brunneum Lat. Witherslack (Day).
Necrophorus humator Goeze. Tebay (Bowman), Melkinthorpe (Britten).
N. investigator Zett. (*ruspator* Er.). Tebay (Bowman), Melkinthorpe (Britten).
N. vespilloides Hbst. (*mortuorum* F.). Kirkby Stephen (Thompson).
Necrodes littoralis L. Melkinthorpe (Britten).
Thanatophilus (*Silpha*) *rugosus* L. Tebay (Bowman), Melkinthorpe (Britten).
Oeceoptoma (*Silpha*) *thoracicum* L. Rydal (Black), Melkinthorpe (Britten).
Silpha tyrolensis Laich. var. *nigrita* Creutz. Tebay (Bowman).
Phosphuga (*Silpha*) *atrata* L. Tebay (Bowman), Melkinthorpe, Cliburn, Patterdale (Britten).
P. (*S.*) var. *brunnea* Hbst. Cliburn, Melkinthorpe (Britten).
Liodes (*Anisotoma*) *dubia* Kug. Lowther Park (Day).
L. (*A.*) *calcarata* Er. Melkinthorpe (Britten), Witherslack (Day).
L. (*A.*) *litura* Steph. (*punctulata* Brit. Cat.). Witherslack (Day).
L. (*A.*) *flavicornis* Bris. Witherslack (Day).
Agathidium badium Er. Patterdale (Dr. Chaster, *Ent. Rec.*, 1904, p. 18).
A. laevigatum Er. Melkinthorpe (Britten).
A. seminulum L. Rydal (Black), Melkinthorpe (Britten).
A. varians Beck. Melkinthorpe (Britten).
A. nigrinum Stm. Rydal (Black).
Colenis immunda Stm. (*dentipes* Gyll.). Melkinthorpe (Britten).
Clambus minutus Stm. Kirkby Stephen (Thompson), Melkinthorpe (Britten).
C. armadillo De G. Melkinthorpe (Britten).
Ptenidium pusillum Gyll. (*evanescens* Brit. Cat.). Melkinthorpe, Cliburn, Patterdale (Britten).
P. nitidum Heer. Melkinthorpe, Cliburn (Britten).
Ptilium kunzei Heer. Melkinthorpe (Britten).
P. kunzei Heer. var. *rugulosum* All. Melkinthorpe (Britten).
Trichopteryx grandicollis Man. Melkinthorpe, Patterdale, Cliburn (Britten).

Trichopteryx thoracica Waltl. Melkinthorpe (Britten).
T. atomaria De G. Kirkby Stephen (Thompson), Cliburn, Melkinthorpe (Britten).
T. lata Mots. Melkinthorpe (Britten).
T. fascicularis Hbst. Melkinthorpe (Britten).
T. sericans Heer. Melkinthorpe (Britten).
T. ambigua Matt. var. *bovina* Mots. Melkinthorpe (Britten).
Scaphisoma agaricinum L. Rydal (Black).
Hister cadaverinus Hoff. Melkinthorpe (Britten).
H. striola Sahl. (*succicola* Thoms.). Melkinthorpe (Britten).
H. neglectus Germ. Tebay (Bowman), Melkinthorpe (Britten).
H. carbonarius Ill. Melkinthorpe (Britten).
H. bimaculatus L. Melkinthorpe (Britten).
Gnathoncus rotundatus Kug. Melkinthorpe (Britten).
Saprinus semistriatus Scrib. (*nitidulus* F.). Melkinthorpe (Britten).
S. aeneus F. Melkinthorpe (Britten).
Onthophilus striatus F. Melkinthorpe (Britten).
Byturus tomentosus F. Tebay (Bowman), Melkinthorpe, Cliburn, Strickland (Britten), Witherslack (Day).
Cateretes (*Cercus*) *pediculārius* L. Tebay (Bowman), Melkinthorpe (Britten).
C. (*C*) *bipustulatus* Pk. Melkinthorpe (Britten).
Brachypterus glaber Steph. (*pubescens* Er.). Melkinthorpe (Britten), Witherslack, Ravenstonedale (Day).
B. urticae F. Tebay (Bowman), Melkinthorpe (Britten), Witherslack, Lowther Park, Ravenstonedale (Day).
Epuræa depressa Gyll. (*aestiva* Er.). Tebay (Bowman), Melkinthorpe (Britten), Witherslack (Day).
E. melina Er. Melkinthorpe (Britten).
E. deleta Er. Melkinthorpe (Britten).
E. florea Er. Melkinthorpe (Britten).
Nitidula bipunctata L. (*bipustulata* L.). Tebay (Bowman), Melkinthorpe (Britten).
Soronia grisea L. Melkinthorpe (Britten).
Omosita depressa L. Melkinthorpe (Britten).
Meligethes rufipes Gyll. Witherslack (Day).
M. lumbaris Stm. Melkinthorpe (Britten).
M. aeneus F. Tebay (Bowman), Melkinthorpe, Cliburn (Britten), Kirkby Stephen (Thompson), Witherslack, Lowther Park (Day).
M. viridescens F. Of similar distribution to the last species.
M. obscurus Er. Witherslack (Day).
M. picipes Stm. Melkinthorpe (Britten), Ravenstonedale, Witherslack (Day).
M. viduatus Stm. Melkinthorpe (Britten), Witherslack (Day).
M. erythropus Gyll. Melkinthorpe (Britten).
Rhizophagus bipustulatus F. Melkinthorpe, Cliburn (Britten).
R. cribratus Gyll. Melkinthorpe (Britten).
Monotoma picipes Hbst. Melkinthorpe (Britten).
Silvanus surinamensis L. Tebay (Bowman).
Laemophloeus minutus Ol. (*pusillus* Schön.). Tebay (Bowman).
Paramecosoma melanocephalum Hbst. Melkinthorpe (Britten).
Micrambe vini Pz. Kirkby Stephen (Thompson), Cliburn (Britten).
Cryptophagus scanicus L. Melkinthorpe (Britten).
C. dentatus Hbst. Melkinthorpe (Britten).
C. pallidus Stm. Melkinthorpe, Lowther Park (Britten).
C. umbratus Er. Melkinthorpe (Britten).
C. cellaris Scop. Melkinthorpe (Britten).
C. affinis Stm. Melkinthorpe (Britten).
C. punctipennis Bris. Melkinthorpe (Britten).
C. setulosus Stm. Tebay (Bowman), Melkinthorpe (Britten).
Antherophagus pallens Ol. Melkinthorpe (Britten).

Atomaria umbrina Gyll (*fumata* Er.). Melkinthorpe (Britten).
A. mesomelaena Hbst. Melkinthorpe (Britten).
A. fuscata Schön. Melkinthorpe (Britten).
A. atricapilla Steph. Melkinthorpe (Britten).
A. fuscipes Gyll. Tebay (Bowman), Melkinthorpe (Britten).
A. pusilla Pk. Melkinthorpe (Britten).
A. apicalis Er. Tebay (Bowman), Melkinthorpe (Britten).
A. analis Er. Tebay (Bowman), Melkinthorpe (Britten).
Ephistemus globulus Pk. (*gyrinoides* Marsh.). Melkinthorpe, Patterdale (Britten).
Lathridius lardarius De G. Witherslack (Day). Melkinthorpe (Britten).
Coninomus nodifer West. Tebay (Bowman), Melkinthorpe (Britten).
Enicmus minutus L. Tebay (Bowman), Cliburn, Melkinthorpe (Britten), Witherslack (Day).
E. transversus Ol. Tebay (Bowman), Melkinthorpe (Britten).
E. histrio Joy and Tomlin. Melkinthorpe (Britten).
Corticaria elongata Gyll. Melkinthorpe (Britten). Witherslack (Day).
C. denticulata Gyll. Melkinthorpe (Britten).
Melanophthalma gibbosa Hbst. Melkinthorpe, Cliburn (Britten).
Pseudotriphyllus (*Triphyllus*) *suturalis* F. Melkinthorpe (Britten).
Mycetophagus 4-pustulatus L. Melkinthorpe (Britten).
Typhaea stercorea L. (*fumata* L.). Melkinthorpe (Britten).
Cis nitidus Hbst. Melkinthorpe (Britten).
C. boleti Scop. Tebay (Bowman), Melkinthorpe (Britten).
Octotemnus glabriculus Gyll. Melkinthorpe (Britten).
Cerylon histeroides F. Melkinthorpe (Britten).
Mycetaea hirta Marsh. Melkinthorpe (Britten).
Aphidecta (*Adalia*) *obliterata* L. Tebay (Bowman), Cliburn (Britten).
Coccinella 7-punctata L. Tebay (Bowman), Melkinthorpe (Britten).
C. hieroglyphica L. Tebay (Bowman), Cliburn (Britten).
C. 10-punctata L. Tebay (Bowman), Witherslack (Day).
Mysia oblongoguttata L. Tebay (Bowman), Cliburn (Britten).
Myrrha 18-guttata L. Tebay (Bowman), Cliburn (Britten).
Hyperaspis reppensis Hbst. Tebay (Bowman).
Pullus (*Scymnus*) *suturalis* Thunb. Cliburn (Britten).
Coccidula rufa Hbst. Tebay (Bowman), Melkinthorpe (Britten).
Dryops (*Parnus*) *ernesti* Gozis. (*auriculatus* Brit. Cat.). Tebay (Bowman), Melkinthorpe (Britten).
Limnius tuberculatus Müll. Tebay (Bowman).
Latelmis (*Elmis*) *volckmari* Pz. Tebay (Bowman), Kirkby Stephen (Thompson).
Helmis (*Elmis*) *maugei* Bed. var. *aenea* Müll. Tebay (Bowman), Lowther Park (Day).
Esolus (*Elmis*) *parallelopipedus* Müll. Kirkby Stephen (Thompson).
Dermestes lardarius L. Melkinthorpe (Britten).
Attagenus pellio L. Tebay (Bowman), Melkinthorpe (Britten).
Simplocaria semistriata F. Tebay (Bowman), Melkinthorpe (Britten).
Cytilus sericeus Forst. (*varius* F.). Tebay (Bowman), Kirkby Stephen (Thompson), Melkinthorpe (Britten).
Byrrhus pilula L. Tebay (Bowman), Rydal (Black), Melkinthorpe (Britten), Witherslack (Day).
B. fasciatus F. Melkinthorpe (Britten).

(*To be continued.*)

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We sympathise with our Past President, Mr. W. N. Cheesman, J.P., of Selby, in the loss of his son, Fred, who died in action during the closing days of the war.

FIELD NOTES.

BIRDS.

Desertion of the Eshton Heronry.—For several years past the old heronry at Eshton, near Gargrave, has been decreasing in the number of nesting pairs of birds, until this year visitors to the Great Wood at Eshton were disappointed to find it altogether deserted as a nesting site by the herons. As reports respecting the new site were rather conflicting, I am indebted to Miss E. H. Wood, who is at present in charge of Eshton and Flasby Halls, for obtaining the desired information from Mr. Bradley, who has been the gamekeeper on the estate for many years. He reports that 'about six years ago they began to go to Lord's Wood, on the Skipton side of Sharper (a prominent hill), and they have gone year by year in increasing numbers, until now there are none left.' Lord's Wood, 'as the heron flies,' will not be more than a mile and a half from the old site in the Great Wood at Eshton; but to reach it the pedestrian would have to make a considerable detour owing to the difficulty of crossing the Eshton Beck. I fancy, however, that the gamekeeper's memory is rather short—like the rest of us in these strenuous times—because when I was through Lord's Wood on March 19th, 1910, there were already two pairs of Herons nesting there, and possibly another pair in a corner of the wood I did not visit. There were certainly three pairs of birds. The late T. H. Nelson, in 'The Birds of Yorkshire,' stated that the Herons left Flasby in 1865 to come to Eshton. This is quite correct so far as it goes; but I have found rumour and tradition so persistent in the neighbourhood of Eshton, that the Herons were established in Lord's Wood before they went to Flasby a little over fifty years ago, so that now they have returned to their original home. Mr. Nelson gives battles with the Rooks as the chief reason for changing the sites. In my opinion the cutting down of timber has been the main cause of the unrest of these Herons for several years now. Herons are very intolerant of tree-felling either in the heronry or near to it—although the actual trees which contain their nests should be scrupulously spared. The felling of timber has been going on slowly but almost continuously on the Eshton estate for many years now. I don't think the whole of the Eshton Heronry has removed to Lord's Wood. The recently formed heronry at Hubberholme, in extreme Upper Wharfedale (*The Naturalist*, 1915, p. 301), still continues and is gradually increasing in numbers, and this season a pair of Herons successfully nested in Bolton Woods; also in Wharfedale. Almost beyond doubt these would all be birds from the now deserted Eshton heronry. —H. B. Booth, Ben Rhydding.

Late appearance of Gonepteryx rhamni.—On October 26th, 1918, a very late date, a male Brimstone Butterfly was in the garden here. I do not myself believe this species hybernates, but that spring specimens are freshly hatched ones. —F. D. Welch, M.R.C.S., Hartley, Kent.

There is nothing very unusual in this date, as *G. rhamni* has often been seen on the wing on a mild sunny day, tempted out of its hybernaculum, even in winter. There is *no doubt* as to the hibernation of the butterfly.—G. T. P.

Goat-Moth Odour.—As regards Mr. Morley's remarks about odour from the Goat-Moth (p. 363), this certainly seems to me to proceed from the caterpillar (but probably also from the perfect insect as well). An oak tree which stood on Southborough Common, Kent, in 1908-10 (and may be still standing), gave off a marked Goat-Moth odour, and there was unmistakeable evidence that it held caterpillars: and two full-fed Goat-Moth caterpillars I had in Hampshire smelt considerably. There seems no doubt that this Goat-Moth odour is 'for protection only' as Mr. Morley terms it (p. 363, l. 33, excluding title); and it corresponds to the stink-glands' odour of Skunks, Ratels and Teledus among mammals, which latter is *not* a sexual smell, but used in self-defence when the mammal is attacked. Clearly some scent comes from the genitals of the perfect female moth, as in the case of the moths mentioned on p. 360 by me, which attracts the male; but there seems no doubt that the characteristic odour is for quite a different purpose, as shown by the caterpillar possessing it.—F. D. Welch, M.R.C.S.

Mr. Morley's allusion was to the *pupa* of *Cossus ligniperda*, and I can confirm what he says, because I have at present in my cabinet a cocoon and its empty pupa case, which for five or six years at least, I should say, emitted a strong disagreeable odour. I do not remember noticing any odour from the larva nor from the moth it produced, which is still one of my series of the species.—G. T. P.

Lancashire and Cheshire Entomologists.—Among the exhibits at a recent meeting of the Lancashire and Cheshire Entomological Society were:—By Mr. F. N. Pierce, *Tephrosia biundularia*, a very dark example of var. *delamerensis* from Delamere and a large number of micro-lepidoptera; by Mr. R. Wilding, *Vanessa urticae*, including a banded variety, *Argynnis aglaia*, *Brenthis euphrosyne*, *B. selene*, *Gonepteryx rhamni* and *Nisoniades tages* from Cartmel, Lancs.; by Mr. S. P. Doudney, *Brenthis euphrosyne*, *Numeria pulveraria*, *Hemerophila abruptaria* and *Notodonta trepida* from Burnt Wood, also a very dark aberration of *Arctia caia* bred from a larva found at Huyton; Mr. J. W. Griffin, nice series of the following—*Bombyx rubi*, *Taeniocampa opima* and *Orthosia upsilon* from Wallasey; *Sphinx*

ligustri, *Smerinthus tiliae*, *Arctia villica*, *Psilura monacha* and *Catocala nupta* from various localities. The Rev. F. M. B. Carr brought *Polygonia c-album* from the Mold district, *Taeniocampa opima* from Frodsham, and the following from Delamere :—*Abraxas ulmata*, a long series, and *Eupithecia coronata* ; he also shewed *Plusia moneta* and stated that this year he had found the larvæ in his garden at Alvanley. Mr. W. Mansbridge shewed the following from N. Staffs :—*Hesperia malvae*, *Nola confusalis*, *Bomolocha fontis*, *Tephrosia biundularia* var. *delamerensis*, *Boarmia repandata*, very dark forms, *Eurymene dolobraria*, *Lobophora halterata* and var. *zonata*, *Tephrosia luridata* and *Eupithecia debiliata*. From W. Yorks. : *Odontopera bidentata*, some very yellow specimens. *Boarmia repandata* var. *nigra* from Knowsley and *Platyptilia ochrodactyla* from Co. Durham. Mr. H. B. Prince, several boxes of Lepidoptera from localities adjacent to Liverpool. Mr. Leonard West had on view some beautifully drawn plates of various aquatic larvæ.—Wm. Mansbridge, *Hon. Sec.*

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MAMMALS.

Colour Observations on Menagerie Specimens.—British Museum mammal skins are kept in dark drawers or boxes away from sunshine. Line 11, p. 303 referred to comparison with Pine only, not Beech Marten. I should like to point out *re* the remarks on p. 362, that the amount of seasonal change in a species cannot be decided by the doings of a *single* specimen in captivity. Large numbers of specimens are required before attempting to lay down any hard-and-fast dogma. Besides, serious objections to an opinion are always liable to be raised in any case where such opinion is founded on a carnivorous mammal in captivity, for the following reasons :—The life is very unnatural, as *no* captive specimen gets the free and healthy exercise which a wild specimen does. The food is unnatural, as food given in captivity is not so nourishing as that killed and eaten in the wild state, with the victim's blood warm in it. The skin and fur of a captive is not in such healthy state as a wild specimen's is, because it does not get sun, wind, rain, etc., playing freely on it, as occurs when a mammal or bird is roaming about wild. As a result of this artificial life in captivity, some specimens of both mammals and birds go through changes which are clearly unnatural and semi-diseased. For instance, I have myself seen one Derbian Parrakeet turn blackish in its plumage as the result of ill-health, and finally return to its normal plumage, whereas another remained normal colour all through * ; and others could be quoted in mammals and birds which have come

* Both lived in London Gardens, 1899 to 1908 ; were fed alike I am told.

under my notice. My words, ' I cannot say . . . . as a whole,' (p. 303, l. 25-26) were inserted because I knew objections were *always* liable to be raised, especially in carnivorous mammals ; in hoofed mammals, objections are not so likely to be made because their life in captivity approaches much nearer in food, etc., to that of the wild state. I should like to make it clear that the wording of the other Zoo specimen was not meant to be hostile to Mr. Pocock ; it was so worded as an attempt to draw information from some reader about the Martens in that locality.—F. D. Welch, M.R.C.S.

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BOTANY.

Viola rupestris var. glabrescens in Yorkshire.—On May 17th last, on Scoska Moor, above Litton Woods, I found two violets which seemed to be new to me. I submitted them to Mrs. Gregory, of Cambridge, who writes, ' Your violets are very near, if not quite, *V. rupestris* var. *glabrescens* . . . . the plant is differentiated from *V. Riviniana* f. *minor* by its stipules, which are broader with *canina*-like teeth, instead of the loose fringed stipules of all forms of *Riviniana*. This is a new record for the county.—C. Waterfall, Chester.

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SCENT GLANDS IN LEPIDOPTERA.

In response to Mr. Porritt's request (page 364) for records on the spring pairing of hybernating lepidoptera, I give the following from my note-book :—' In Deffer Wood, April 9th, 1913, found *Cerastis vaccinii* paired.' ' During early April, 1907, took seven specimens of *Calocampa exoleta* at sallow bloom, five males and two females. The females were kept alive for a considerable time by being fed with a sweetened sponge, but they both died without laying eggs.'

Mr. W. G. Sheldon obtained ova of *Peronea cristana* for the first time, and was thereby able to give the life-history of the species, by sleeving out both sexes through the winter (see *The Entomologist*, pp. 219-220, 1917).

For *Xylina semibrunnea* see *Ent. Record*, Vol. XIII., page 249, and on the necessity of keeping through the winter, both sexes of *Hoporina croceago* when eggs are wanted see Tutt's ' Practical Hints,' Vol. II., page 3.

I think I have seen *Depressaria applana* paired in spring but have kept no record, and regret my inability to find the note on the spring pairing of *Vanessa urticae* on which I based my assertion, it is hidden somewhere in some magazine. *Dasypolia templi*, on the other hand, pairs in the autumn and the males die off before the winter (see *The Naturalist*, p. 430, 1910).

Perhaps it will now be of interest to give my reasons for the belief in the importance of vibrations to lepidoptera. The conviction is based on what I think is a solution of the problem of moths flying on to a sheet when one is used with the light-collecting method on Wicken Fen.

A white sheet, about seven feet high and four yards broad, is stretched broadside to the wind. To the windward of it a lamp is placed on a stand about forty inches high. Very few moths indeed go to the lamp at all, the vast majority fly with a thump on to the sheet. On a good night the swarms of diptera, coleoptera, trichoptera, etc., besides lepidoptera

on the sheet, in frantic activity, is a wonderful sight. But why should the insects go to the sheet and not to the light? My belief is that the wind carries the vibrations made by the light on the the sheet, which retards their progress into space and consequently causes a congestion, and it is into the congestion that the moths come; moreover large species like *Smerinthus ocellatus*, the line of flight of which can be followed by the eye, seem to come from the region behind the sheet, which is not illuminated by the lamp. When they arrive over the sheet they describe a quick curve in the air and alight with a crash among the grass at the foot of the sheet. Another peculiarity is that most of the species that come have a certain antic of their own, which every individual performs on arrival, and generally keeps up all the time it remains. A few species, however, come very quietly and take up a position of repose at once.

Any other explanation than the one given I have failed to discover. In case there was no sheet, then the moths would fly to the lamp, because apparently the lamp would be the centre, and therefore the place where the vibrations would be strongest. In the event of this theory becoming an established fact, then this relationship of things would compel a serious recognition of the possibility that when male moths visit light the action is associated with emotional impulses. But even then the males of apterous female species would again present a difficult problem as they are frequent visitors to light.

There now remains the problem of males visiting a box which encloses a virgin female. We know that the walls of the box would greatly retard the dissemination of scent, but what effect would they have on vibrations; are they known to pass through solid substances? This is an important question.

This discussion is now taking on a feature which personally I think is incompatible. The vertebrate and the invertebrate are too widely separated biologically for points out of one order to be used to prove problems in the other. It must be remembered that the biological structure of female moths only allows one period of gestation, and not successive periods as in mammals; moreover, moths have antennæ and not noses like cats and dogs, and notwithstanding the noise made by the Death's Head Hawk Moth, it is absolutely impossible for it to articulate cries of emotion as wild beasts and birds do.

B. Morley, Skelmanthorpe.

I am glad Mr. Morley has been able to record a single instance of the pairing of lepidoptera in the spring. I had in my mind the statement that *Vanessa urticæ* pairs in the spring when I wrote the note, and my object was to bring out an absolute fact in support of the belief. Mr. Morley is not so convincing in his outside references. My friend, Mr. Sheldon, captured his *Peronea cristana* in the New Forest, and sleeved up both sexes in the autumn, but he does not say that he ever saw any moth paired either during the autumn or spring. Likely enough the females had already paired before he took them. And of the *Xylina semibrunnea* Mr. Thornhill states distinctly that although he kept the captured male and female together from autumn to spring, he never saw them paired. I cannot at the moment put my hand on the note on *Hoporina croceago*, although I know I have it somewhere. But in that case also, as far as I remember, it was a matter of surmise, and I believe that practically all females of the species captured in the early spring lay fertile eggs. I am not at present going to discuss Mr. Morley's further notes on vibration, although a good deal might be said. It is a rather 'far cry' to shift the supposed attraction, through vibration, by the moths, to that of light in street and other lamps; and I will only say that I no more believe that efficient vibration can come through the glass of a lamp than it can through a wood box. The theory is too 'far fetched,' and to my mind utterly absurd.—G. T. P.

Naturalist.

YORKSHIRE NATURALISTS' UNION: GEOLOGICAL SECTION.

The annual meeting of the Geological Section of the Yorkshire Naturalists' Union was held on Saturday, October 19th, in the Tempest Anderson Hall of the Yorkshire Philosophical Society's Museum at York. Dr. Albert Gilligan was elected as President for the ensuing year, and occupied the chair during the meeting. Mr. John Holmes was re-elected as secretary, and the various sectional committees, which it was reported had held no meetings during the year, were reappointed.

Mr. Holmes brought forward proposals for getting some at least of the committees to work again immediately on the termination of the war. He drew attention particularly to researches which Dr. Wheelton Hind had carried out in the 'zoning' of the shales of the Carboniferous rocks of the Ribble Valley, from Clitheroe in the direction of Skipton. Originally the district was surveyed stratigraphically, but the more positive identification of the rocks by the fossils they contained, which had been made possible by Dr. Wheelton Hind's researches in Staffordshire, had been carried out locally by Dr. Hind, and had corrected the maps in some particulars. The result of the researches would shortly be published, and Mr. Holmes suggested that the investigation on Dr. Hind's lines and with his help in the identification of the fossils should be extended over the Craven area.

Mr. Herbert E. Wroot, secretary of the Yorkshire Geological Society, drew attention to the fact that the Geological Society had, when war broke out, arrangements in hand for a thorough investigation of the Yorkshire rivers on the lines of research which had been developed in America, with results of much interest. A start in Yorkshire was to be made with the Washburn. It was intended that this work should be resumed when the war ended, and he suggested that the researches set afoot by Dr. Hind should be extended over the Washburn Valley in preparation for the Geological Society's labours, in which it was hoped that the members of the Naturalists' Union and others interested would share. It was decided to present a report to the annual meeting of the Union in favour of these projects.

Mr. Wilfrid R. Barker gave a short address, in the course of which he said that the great demand for coal during the present war had led to widespread mining activities along the outcrop of the Barnsley Bed coal. Numerous small colliery companies were working it; some by day-holes and others in open workings, and a great amount of coal had been already won. Although this weathered coal was only poor in quality it answered well for firing boilers, and the workings produced very interesting exposures of the bed for geological study. Mr. Barker showed some admirable lantern pictures of a section exposed near Worsborough Reservoir, which had the interest of being a part of a small fold or anticline, the top of which had been worn off. The coal was about 10 ft. thick, but was interrupted by a deposit of mudstone, which from being only an inch in thickness rapidly thickened considerably and was evidently the muddy bed of a stream-course. Along the margin of this interruption a great variety of fossil plants had been discovered. Mr. Barker mentioned that as each different district was opened new associations of plants were discovered, and altogether more than 200 species had been collected by himself in these beds. A number of exceptionally fine lantern pictures was shown of some of the most interesting of these plants, several of which showed the primitive spore-cones and seeds.

Dr. Gilligan, in a short address, discussed the faulting of the coalfield. Most of the dislocations of the strata were, he showed, due to causes which produced a stretching of the beds, and as gaps were produced they were filled by the letting down of wedge-shaped masses of the overlying rocks. Yet though the stretch-faults were universal there existed in the anticlines, such as that described by Mr. Barker, evidence that forces of compression had operated. That phase Dr. Gilligan believed had been in

some cases temporarily only and had been followed by a relaxation of the compression. The result had been to produce faults of an anomalous kind. In most faults the down-thrown side turned upward and the up-thrown side turned downward. But in some cases—as at the famous Peak Fault, in the Jurassic rocks at Ravenscar, the opposite effect was noticed, the down-thrown side turning downward and the up-thrown side turning upward. This had been very puzzling to geologists. With the aid of a diagram Dr. Gilligan showed that where an anticline had been faulted diagonally across one limb by a relaxation of the forces of compression, this effect might be produced. Thanks were accorded to the chairman and speakers.—H.E.W.

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YORKSHIRE NATURALISTS' UNION: ENTOMOLOGICAL SECTION.

On October 26th the members met in the York Museum, Mr. G. T. Porritt presiding. Supplementary reports to those presented for the Annual Meeting of the Union are as follows:—Mr. Willoughby Fabian reports *Nemeophila russula* and *Lithosia mesomella* from Strensall Common and *Sphinx ligustri* from York. *Plusia moneta* was common in the same city and Mr. J. Porter reports the same from Hull. At York, on May 25th, *Vanessa antiopa* was taken, *Zeuzera pyrini* in July, and *Chaerocampa elpenor* larvæ in September is reported from the same place by Mr. E. H. Tye. Mr. Arthur Smith reports *Sesia culiciformis, Eupithecia lariciata* from Warthill, a spotless variety of *Epinephele hyperanthus, Acidalia emarginata, Epione apiciaria, E. paralellaria* (plentiful) and *Cosmia paleacea* from Sandburn, and *Dicranura bifida* and *Collix sparsata* from Askham Bogs. Mr. G. T. Porritt reported the Neuropteron *Chrysopa tenella* in abundance at Huddersfield after an apparent scarcity for some years. Dr. H. H. Corbett reported *Pararge megaera* from Doncaster.

Mr. W. J. Fordham reports that 'Mr. Porritt showed *Coniopteryx aleurodiformis*; Mr. Hewitt showed the beetle *Acanthocinus aeditis* taken in York (of course imported in timber). Mr. Thompson's list was *Acidota cruentata, Demetrias atricapillus, Tachinus proximus, Lathrobium boreale, L. multipunctum, Trogophloeus elongatulus, Pissodes notatus, Rhizophagus ferrugineus, Bruchus rufimanus, Trachyphloeus scaber, Magdalis armigera, M. pruni* and *Hylastes ater*.

Dr. Fordham exhibited nearly 70 species of Hymenoptera new to the county, including some rare Ichneumons, Diptera and Sawflies. Also beetles including *Bembidium doris* and *Molorchus minor*, both new to Yorks., and a specimen of the 'fire-beetle' *Melanophila acuminata* from Crowthorne, Berks.

Several ichneumons, etc., bred by Rev. C. D. Ash from lepidopterous larvæ, were shown, including—

Apanteles lacteipennis ? (new) ×*russula*.
Hemiteles fulvipes (new) ×*grossalariata*.
Promethus sulcator } Saxton: Both new to Yorks.
Perithous divinator } C. D. Ash.
Clistopyga incitator } Askham Bog, W. J. Fordham.
Hemiteles cingulator } Both new to Yorks.

The parasite (braconid) *Spathius exarator* which preys on the Death Watch (*Anobium*) from Saxton (C. D. Ash; new to Yorks.), and the rolled leaves of Oak rolled by *Attelabus curculionoids* from Huddersfield district (W. Falconer).'

Neuroptera.—Mr. Porritt showed *Coniopteryx aleyrodiformis* and *Limnophilus hirsutus* from Huddersfield, and Mr. B. Morley the snake-fly *Raphidia notata* from Wakefield.

Lepidoptera.—Mr. Porritt showed *Abraxas grossularitata* varieties *nigra, nigrosparsata* and *Varleyata nigrosparsata* bred from Huddersfield

larvæ, and Mr. B. Morley showed *Crambus pinellus*, *Sciaphila sinuana* and *Cerostoma sequella* for Skelmanthorpe.

At the evening meeting Dr. Corbett read a most interesting paper on the rare hymenopteron *Meliora aparamus* in Martin Beck Wood near Doncaster, after which another entomological problem which has also been discussed freely in the columns of *The Naturalist* lately, afforded much interest by the advancement of the various views of the members.

B. Morley, Skelmanthorpe.

———: o :———

A Monograph of the British Lichens: Descriptive Catalogue of the species in the department of Botany, British Museum, Part 1, second edition, by **Annie Lorrain Smith, F.L.S.** Printed by order of the Trustess of the British Museum, 1918.

Prior to 1866 the classification generally accepted by Botanists, more especially by Nylander, was based mainly upon the morphology of the Lichen thallus and the plants were considered as a group separate and distinct from all others in the vegetable kingdom. From 1866 onwards, however, Schwendener and others pointed out that Lichens were dual organisms composed of fungal elements, living in society with Algæ. This statement developed a school of Lichenologists who saw that a new classification must be adopted to coincide with such a change of view. Leighton, however, still followed in his third edition of British Lichens in 1879 the Nylanderian system of classification (being a continuation of his previous editions); he evidently did not accept the new conditions. In 1890, Dr. Wainis, of Helsingfors, published his 'Lichens of Brazil,' based upon the alliance of Fungi with Algal constituents. The principle of his classification with amendments has come to be accepted and universally adopted by all continental and American Botanists; Crombie, a disciple of and a co-worker with Nylander, still held Nylanderian views and published his 'Monograph of Lichens found in Britain, being a Descriptive Catalogue of the Species in the Herbarium of the British Museum,' Part 1, 1894. Part 2 was then believed to be so advanced that it was expected to appear in 1895. Crombie died April, 1906, without the promised part being issued. It being necessary to complete the work, Miss Annie Lorrain Smith undertook the task, and Part 2 was published in 1911 under the same title, but following the more scientific system. It was then found necessary to complete the work by re-arranging Crombie's Part 1 in accordance with modern views, the result being the issue of the present volume, Part 1 (new edition), 1918, now under review. This volume contains 354 pages of descriptive matter, 10 pages of a very useful glossary, 41 pages of index with synonyms, and 59 full-page plates arranged as in Part 1. Those of us who have worked with Part 2 during the past seven years felt intuitively that when Part 1 came to hand we should have a couple of volumes equal to, if not surpassing, any continental Lichen Flora yet issued. Though the official titles to these volumes would lead one to think they only contained descriptions of such plants as are actually deposited in the British Museum, yet it may safely be considered that in these we possess a complete British Flora of Lichens so far as yet known. We are sorry to miss many old and familiar names which have had to be changed owing to the recent Botanical rules as to priority, and replaced by those of previous authors. This may lead to much confusion amongst those who will not close their favourite books by authors such as Leighton, Crombie, Mudd or Nylander, the value of which now lies mainly in their usefulness as standards for reference. Miss Smith has a decided tendency to the 'lumping' of species, this perhaps being preferable to the 'splitting' process. Experience tends to strengthen our view that in no group of plants is there such a wide variation amongst individuals as in Lichens, yet always there is a peculiar specific facies rendering them easily recognizable. If attention be paid to the exact wording of the various des-

criptions, no difficulty will be found in recognizing any species. We note that several species new to Britain are recorded from Yorkshire. This should encourage local collectors to further efforts, our county has never had the thorough search given to many of its neighbours, and the upper reaches of the Wharfe, Aire and Ribble may be considered as practically unexplored country. Lichens are allied with Fungi and have attracted the attention of Mycological Societies in England. The Mycological Section of the Yorkshire Naturalists' Union and the British Mycological Society have both appointed leaders or referees on the subject. It is therefore to be hoped that members during their Forays will give attention to Lichens as well as to Fungi. To young students and collectors, unbiased by old classifications, these two volumes will be of inestimable value, and certainly will remain the standard British Lichen Flora for many years to come.—THOS. HEBDEN.

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NORTHERN NEWS, etc.

In *British Birds* for October a Caspian Tern is recorded for Sussex. It was taken in June, 1916, was duly 'seen in the flesh,' and the record is now made public.

The Annual Meeting of the Union will be held at the University, Leeds, on Saturday, December 7th, commencing at 2-30 p.m. The title of the Presidential Address by Prof. Garstang is 'Nature and Man.'

In *The Entomologist* for October Mr. Claude Morley writes on the 'Confirmation of *Trigonalys hahni*, of the Hymenopterous Family Trigonalidæ, as British,' on the evidence of a specimen taken at Doncaster by Dr. Corbett.

Our readers will much regret to hear of the sudden death of Miss Maude Seymour, whose duties in the Library of the Geological Society of London frequently brought her into touch with geologists throughout the country, to whom her knowledge of geological literature was so helpful.

Among the well illustrated Natural History articles now appearing in various journals, we notice the following, all by our contributor, Mr. Riley Fortune, F.Z.S. :—'The Ruff and Reeve,' in *The Badmington Magazine* for October, 1918; 'The Curlew in Yorkshire,' in *The Illustrated Sporting and Dramatic News*, October 26th, 1918; 'Seals on the North-east Coast,' in *Country Life*, November 9th, 1918.

The Memoirs and Proceedings of the Manchester Literary and Philosophical Society, Vol. LXII., Part 1, includes the following items :—'Presidential Address,' by William Thomson; 'Natural and Artificial Parthenogenesis in Animals,' by D. Ward Cutler; 'The Organisation of Museums and Art Galleries in Manchester,' by W. Boyd Dawkins. Mr. Thompson's address deals with the Society in its earliest days.

We regret to note the death of Canon Alfred Merle Norman, M.A., LL.D., D.C.L., F.R.S., F.L.S., who was born in 1831. He was a medallist of the 'Institute' of France, and in 1906 received the Linnean Society's Gold Medal. He was a past-president of the Conchological Society and of the Museums Association. We learn from *The Times* that 'He was the most active of sea dredgers, ranging over the North Sea to the fjords of Norway, the Shetlands, and away into the Atlantic. By his own dredging cruises he accumulated a vast collection, of which he issued a catalogue in several parts, under the title of "Museum Normannianum." This collection was ultimately acquired by the Trustees of the British Museum. It includes about 6,000 crustacea, many of them the types of species, about 3,500 sponges, of which many are type-specimens, 300 or so tunicates, comprising the types of Alder and Hancock, besides thousands of echinoderms, corals, and other groups.' Years ago, Canon Norman frequently favoured *The Naturalist* with particulars of his researches among the crustaceans, etc., of the waters adjoining the north-east coasts.

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COMPILED BY W. E. L. WATTAM.

It is not an index in the strictest sense of that term, but it is a classified summary of the contents of the volume, arranged so as to be of assistance to active scientific investigators; the actual titles of papers not always being regarded so much as the essential nature of their contents.

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CORRIGENDA.

Page 3, *for* " wings " *read* " rings."
,, 31, line 26, *for* " Masterman " *read* " Westerman."
,, 63 ,, 8, *for* " Feizar " *read* " Feizor."
,, 63, ,, 23, *for* " Schard " *read* " Schrad."
,, 63, ,, 26, *for* " Tricha " *read* " Trichia."
,, 64, bottom line, *for* " flarogenita " *read* " flavogenita."
,, 64, line 10 from bottom, *for* " Morh " *read* " Mohr."
,, 166, ,, 27, *for* " A. inflator " *read* " A. trilineatus."
,, 168, ,, 16, *for* " E. macrorrhyncus " *read* " macrocheles."
,, 218, ,, 22, *for* " Gait " *read* " Goit."
,, 218, ,, 23, *for* " they " *read* " there."
,, 218, ,, 30, *for* " Buck " *read* " Back."
,, 237, ,, 13, *for* " of " *read* " by."
,, 237, ,, 18, *for* " reed " *read* " pied."

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Printed at BROWNS' SAVILE PRESS, 40, George Street, Hull, and published by A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London.
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